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October 2, 1940

NATIONAL PETROLEUM NEWS

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OCT 3 - 1940
DETROIT

Catalytic Desulfurization Solves Problem in High-Sulfur Distillate

Sulfur reduction from 0.257% to .004% with a gain of 2.7 octane numbers and improvement of 7.5 numbers in response to 1 cc. of tetraethyl lead is experience of 1000-barrel unit in West Virginia.

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• • •

Versatility in Fatty Acid Selection Sharpens Control in Grease Making

Page R-360

• • •

Boundary Lubrication Explained By Polishing and Wedging Agents

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NEWS IN BRIEF

22 Majors and A. P. I. Named in Oil Suit

* * *

U. S. markets not disturbed by crude imports, says State Department. Page 26.

* * *

National Lubricating Grease Institute meets at Chicago. Page 18.

* * *

Thompson remains silent about rumor that he might be federal commissioner. Page 13.

El Dorado field celebrates 25th year of production. Page 18.

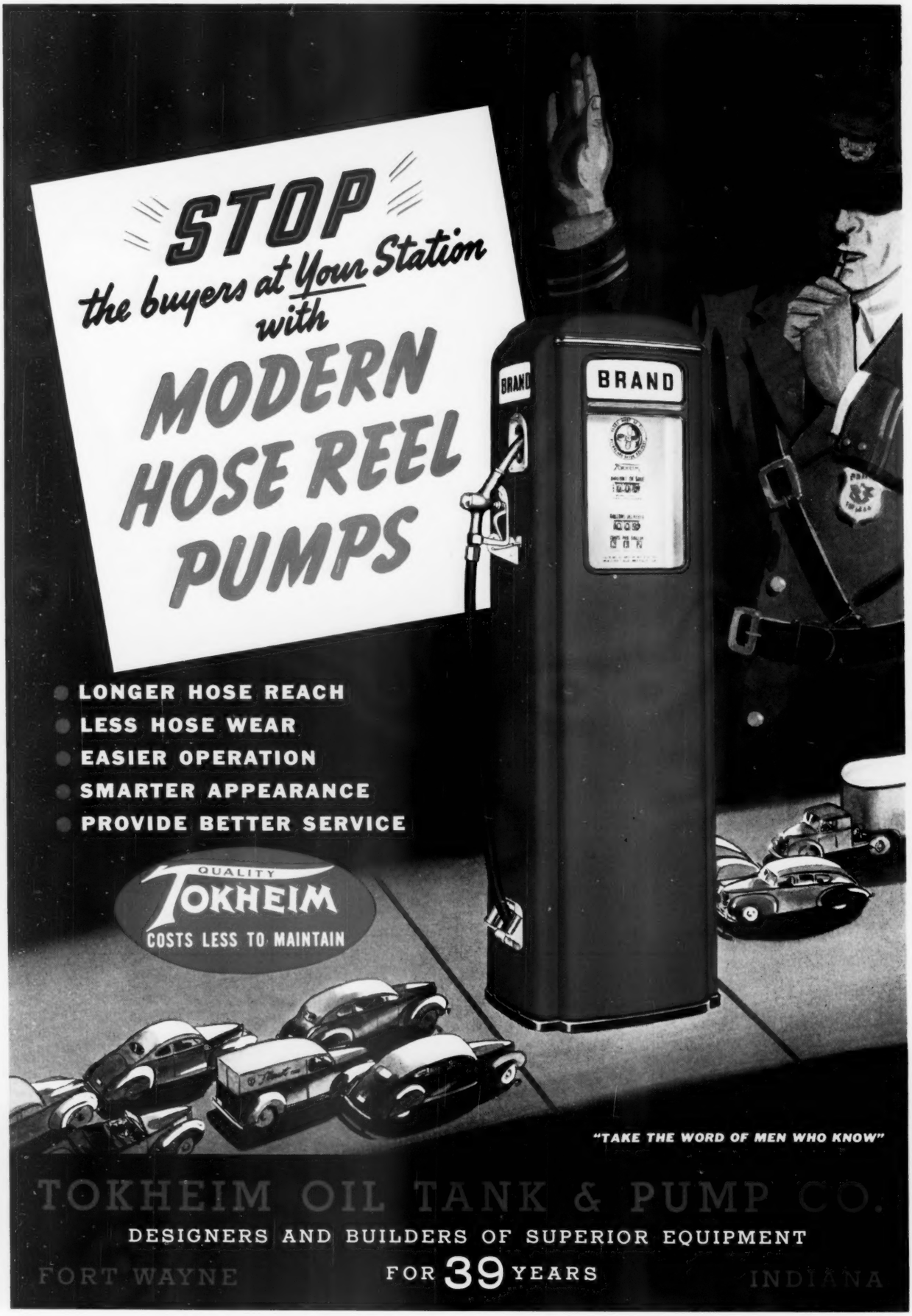
* * *

Aviation gasoline down 80,763 barrels at G.C.R.A. refiners. Page 26.

* * *

Gasoline taxes will zoom to about $1,162,000,000 in 1940, Markham states. Page 16.

REFINING TECHNOLOGY EDITION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COMING MEETINGS

OCTOBER

American Gas Assn., Atlantic City, New Jersey, Mon.-Thurs., Oct. 7-10.
National Safety Congress & Exposition, Hotel Stevens, Chicago, Ill., Mon.-Fri., Oct. 7-11.
Indiana Independent Petroleum Assn., Fall Convention, Hotel Severin, Indianapolis, Wed.-Thurs., Oct. 9-10.
Automobile Manufacturers Assn., 1940 Autoshow, New York, Sat., Oct. 12.
SAE Annual Dinner, Hotel Commodore, New York, Mon., Oct. 14.
National Stripper Well Assn., Dallas, Tex., Tues., Oct. 15.
Independent Petroleum Assn. of America, Annual Meeting, Dallas, Texas, Wed.-Fri., Oct. 16-18.
New England Tax Conference, Mountain View Hotel, Whitefield, N. H., Wed.-Fri., Oct. 16-18.
American Institute of Mining and Metallurgical Engineers, Petroleum Division, Los Angeles, Oct. 17-18.
National Dixie Distributors, Inc., Hot Springs, Ark., Monday, Oct. 21.
American Institute of Mining and Metallurgical Engineers, Petroleum Division, Tulsa, Okla., Thurs.-Sat., Oct. 24-26.
Western Petroleum Refiners Assn., Regional Meeting, Shreveport, La., Fri., Oct. 25.
Petroleum Refiners Division, Credit Men's Fall Meeting, Mayo Hotel, Tulsa, Okla., Mon.-Wed., Oct. 28-30.
Oil Trades Assn. of New York, Annual Banquet, Waldorf-Astoria Hotel, New York, N. Y., Tues., Oct. 29.

NOVEMBER

California Natural Gasoline Assn., Los Angeles, Calif., Fri., Nov. 1.
Tennessee Oil Men's Assn., Fall Convention, Chattanooga, Tenn., Wed.-Fri., Oct. 30-Nov. 1.
Texas Mid-Continent Oil & Gas Assn., Fort Worth, Tex., Thurs.-Sat., Oct. 31-Nov. 2.
SAE, National Aircraft Production Meeting, Biltmore Hotel, Los Angeles, Calif., Thurs.-Sat., Oct. 31-Nov. 2.
American Assn. of Petroleum Geologists, Los Angeles, Calif., Thurs.-Fri., Nov. 7-8.
SAE, National Fuels and Lubricants Meeting, Thurs.-Fri., Nov. 7-8.
American Petroleum Institute, 21st Annual Meeting, Stevens Hotel, Chicago, Ill., Mon.-Fri., Nov. 11-15.
Arkansas Oil Dealers Assn., Little Rock, Ark., Thurs., Nov. 14.
Arkansas Society for Testing Materials, Hotel Mayflower, Washington, D. C., Thurs., Nov. 14.
Missouri Independent Oil Jobbers Assn., Fourth Annual convention, Hotel DeSoto, St. Louis, Mo., Wed.-Thurs., Nov. 27-28.

DECEMBER

American Institute of Chemical Engineers, New Orleans, La., Mon.-Fri., Dec. 2-6.
National Asphalt Conference, Dallas, Tex., Mon.-Sat., Dec. 9-14.
South Dakota Independent Oil Men's Assn., 22nd Annual Convention, Coliseum Annex Bldg., Sioux Falls, Iowa, Tues., Wed., Dec. 10-11.

JANUARY, 1941

SAE Annual Meeting, (and Engineering Display) Book-Cadillac Hotel, Detroit, Mich., Jan. 6-10.
Oil Trades Assn. of New York, Quarterly Meeting and Dinner, Waldorf-Astoria, New York, Jan. 21.

FEBRUARY, 1941

Kentucky Petroleum Marketers Assn., Fifteenth Annual Meeting and Convention, Brown Hotel, Louisville, Ky., Feb. 11-12.
North Texas Oil & Gas Assn., Wichita Falls, Tex., Feb. 22.
Iowa Independent Oil Jobbers Assn., Des Moines, Ia., Feb. 26-28.
American Petroleum Institute, Division of Production, Southwestern District, Washington-Youree Hotel, Shreveport, La.

MARCH, 1941

American Society for Testing Materials, Hotel Mayflower, Washington, D. C., March 3-7.
Indiana Independent Petroleum Assn., 1941 Spring Convention & Refiners' & Suppliers' Exhibit, Hotel Severin, Indianapolis, Ind., March 11-13.
Oil Burner Institute, Progress Exhibition, Commercial Museum, Philadelphia, Pa., March 17-22.

APRIL, 1941

American Assn. of Petroleum Geologists, 26th Annual Meeting, Rice Hotel, Houston, Tex., April 2, 3 and 4.
National Petroleum Assn., semi-annual meeting, Hotel Cleveland, Cleveland, Ohio, April 24-25.

NATIONAL PETROLEUM NEWS

OCTOBER 2, 1940

NEWS

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V. B. GUTHRIE, *Managing Editor*

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THIS WEEK WITH NPN

"SICK" STATION

An article in this issue might well be the story of another "Iowa Plan" victim. It tells how a "sick" station suffering from a severe case of lost gallonage, was diagnosed by the marketer. It was found that poor arrangement of working shifts was affecting volume. Careful "nursing" brought the station back to a healthy condition. See page 34.

HOW WE DO IT

Only four copies were available of the 61-page anti-trust suit against 22 major companies and the A.P.I.—one was filed with the court, one went to the Government Printing Office, one is in the justice department's files while the fourth copy was "nailed down" in the department's press room. But we had stenographers take down the text in shorthand and teletype it to NPN. It was a tremendous job—but it's the biggest story of the year. So we shoot the works.

OIL BURNERS

Wider markets for burners and fuel oil are predicted in the Oil Burner article in this issue. Increased efficiency of new model burners is accelerating replacements and the low cost of some burners is opening the small-home market. As a consequence, the outlook for burner sales is brighter than ever with an increase in fuel oil consumption as a natural aftermath. See page 27.

PICTURES

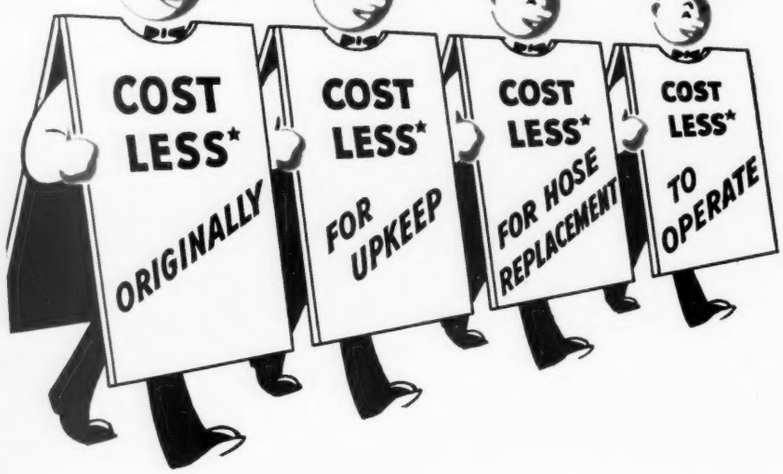
A Chinaman once said, "A picture is worth 10,000 words." If that's so, then we're Chinamen, for this issue of NPN bristles with pictures. For example, we've pictures of the outing of the New Jersey oil men, a group picture of about 60 Virginia oil men and many others. Better, look, you might be in one of these pictures.

NEXT WEEK

Winter's right around the corner, and in next week's NPN you'll find a complete check-list to help you prepare for wintry blasts. Other pre-winter hints will be carried to help you get ready.

ADVERTISING PAGES REMOVED

. . . NATIONAL'S MANY EXCLUSIVE FEATURES COST YOU LESS



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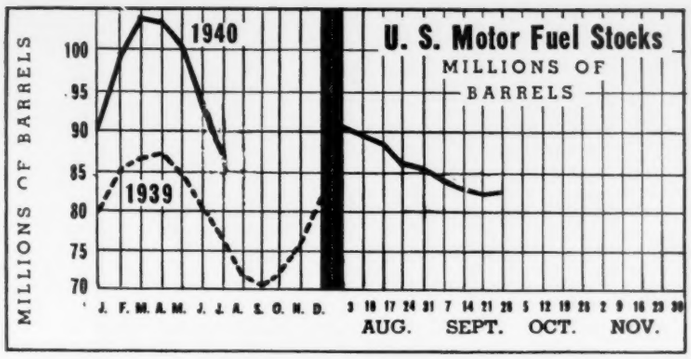
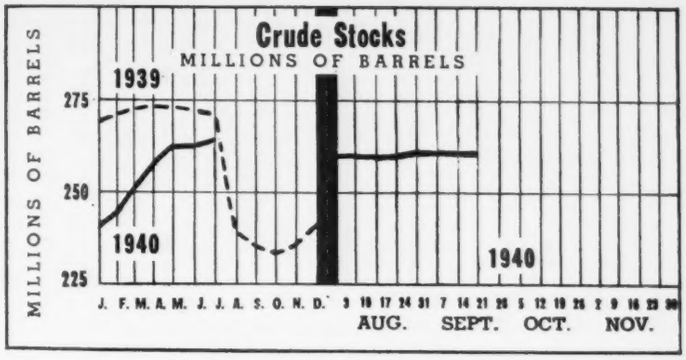
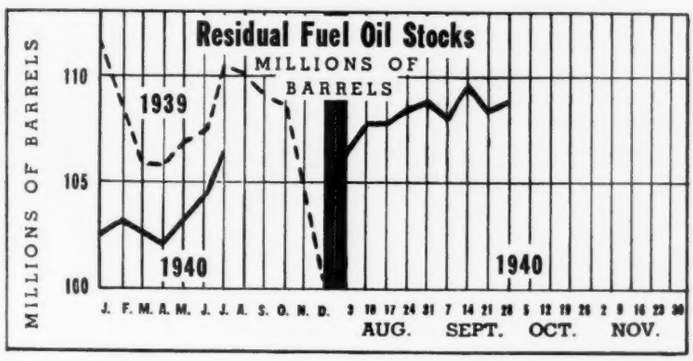
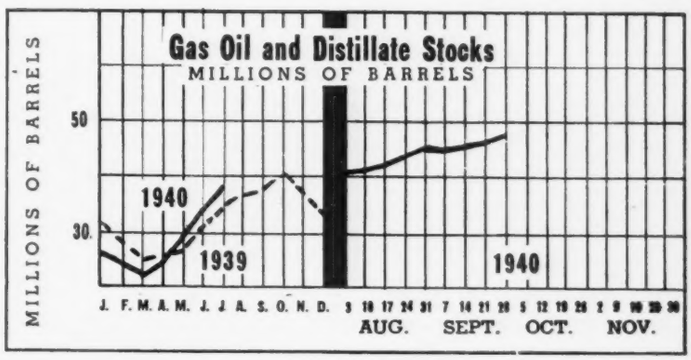
LATEST OIL INDUSTRY
· STATISTICS ·









A. P. I. Weekly Refinery Report

(Figures in Thousands of Barrels of 42 Gallons Each)

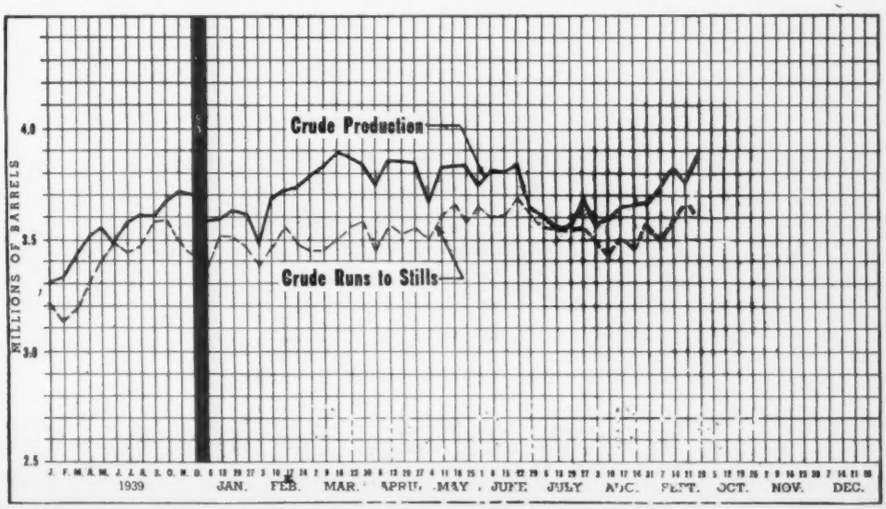
Districts	Daily Average Crude to Stills Week Ended		Per Cent of Reporting Capacity Operated Week Ended		(a) Gasoline Production Week Ended		Stocks Total Finished & Unfinished Motor Fuel (b) Week Ended		Stocks of Gas Oil & Distillates At Refineries Week Ended		At Terms. Trans. Pipelines Week Ended		Stocks of Residual Fuel Oil At Refineries Week Ended		At Terms. Trans. Pipelines Week Ended	
	Sept. 28	Sept. 21	Sept. 28	Sept. 21	Sept. 28	Sept. 21	Sept. 28	Sept. 21	Sept. 28	Sept. 21	Sept. 28	Sept. 21	Sept. 28	Sept. 21	Sept. 28	Sept. 21
East Coast	543	604	84.4	93.9	1,507	1,489	20,804	21,114	9,439	9,102	8,717	8,677	6,750	6,578	6,062	5,803
Appalachian	120	123	84.5	86.6	466	439	3,213	3,224	335	316	269	238	587	561	....	....
Ind., Ill., Ky.	627	609	93.6	90.9	2,355	2,388	13,703	13,723	3,774	3,717	1,934	1,910	3,073	3,076	298	295
Okla., Kans., Mo.	270	278	83.6	86.1	(c)989	(c)1,063	6,074	6,154	1,544	1,582	117	109	2,246	2,208	....	....
Inland Texas	109	123	65.3	73.7	473	526	1,495	1,562	385	394	....	....	1,519	1,511	....	....
Texas Gulf	834	856	91.2	93.7	2,557	2,610	10,863	10,595	6,675	6,497	1,020	977	7,554	7,103	236	252
La., Gulf	120	114	75.0	71.3	288	284	2,515	2,750	1,313	1,228	15	21	1,530	1,508	221	270
No. La., Ark.	48	44	92.3	84.6	116	132	483	461	337	328	9	6	471	528	....	....
Rocky Mt.	55	59	80.9	86.8	216	256	916	913	129	126	....	....	469	504	....	....
California	514	505	70.4	69.2	1,445	1,492	15,327	15,479	8,263	8,203	2,091	2,107	53,376	53,970	21,943	21,904
Total Reporting	3,240	3,315	83.7	85.7	10,412	10,679	75,393	75,975	32,194	31,493	14,172	14,045	77,575	77,547	28,760	28,524
U. S. Total (d)	3,600	3,680			11,832	12,135	83,373	82,960	33,144	32,443	14,842	14,720	79,540	79,517	28,910	28,674
U. S. Total 9-28-39 (d)	3,517				11,846		71,082		28,011		10,093		86,663		27,583	

(a) Includes straight-run, cracked and natural blended.
(b) Includes stocks at refineries, in bulk-terminals, pipe lines and in transit.
(c) 12% of reporting capacity in this district did not report gasoline production.
(d) Estimated, U. S. Bureau of Mines basis

Crude Oil Production for the U. S.

(American Petroleum Institute figures)

	Week Ended Sept. 28 Barrels	Week Ended Sept. 21 Barrels
Oklahoma	405,000	404,250
Kansas	193,550	201,700
Nebraska	400	250
Texas	1,517,300	1,316,650
Louisiana	283,450	284,650
Arkansas	74,450	72,550
Mississippi	22,450	27,000
Illinois	361,350	354,150
Indiana	17,900	17,950
Eastern (Ill. and Ind. excl.)	89,900	89,300
Michigan	50,300	50,000
Wyoming	76,900	77,800
Montana	17,250	17,200
Colorado	3,550	3,450
New Mexico	97,600	97,150
California	588,600	607,000
Total U. S.	3,799,950	3,621,050
Crude Imports	95,570	138,570
Total New Supply	3,895,520	3,759,620



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· STATISTICS ·

N.P.N. GASOLINE INDEX

	Dealer T.W. Cents	Tank Car Per Gallon
Sept. 30	8.66	5.11
Month ago	8.84	5.22
Year ago	9.74	6.21

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 9 wholesale markets for regular-grade gasoline.

Weekly Changes in Crude Oil Stocks*

(Thousands of barrels)

Grade or origin	Sept. 14	Sept. 21	Change from Sept. 14
Pennsylvania Grade	4,790	4,798	+ 8
Other Appalachian	1,399	1,395	— 4
Lima-Michigan	1,427	1,429	+ 2
Illinois-Indiana	20,433	19,860	—573
Arkansas	3,236	3,266	+ 30
Kansas	7,835	8,000	+165
Louisiana:	14,269	13,959	—310
Northern (inc. Miss.)	4,992	5,240	+248
Gulf Coast	9,277	8,719	—558
New Mexico	6,960	7,147	+187
Oklahoma	65,727	65,294	—433
Texas:	80,669	81,279	+610
East Texas	18,388	18,408	+ 20
West Texas	17,781	17,931	+150
Gulf Coast	19,724	19,667	— 57
Other Texas	24,776	25,273	+497
Rocky Mountain	16,407	16,368	— 39
California	36,190	36,064	—126
Foreign	3,133	3,350	+217
Total U. S. refinable	262,475	262,209	—266
Heavy in California	12,713	12,574	—139

*As compiled by U. S. Bureau of Mines.

Aviation Gasoline Exports*

(Dept. of Commerce figures)

	July	Aug.	Percentage Change
United Kingdom	12	54,346	+45,278.33
Netherlands West Indies	104,117	207,181	+ 98.99
Japan	13,880	6,310	— 54.54
Quantung	27,058	2,194	— 91.89
Other	30,086	39,393	+ 30.93
Total (bulk and containers)	175,153	309.424	+ 76.66

*Figures in barrels.

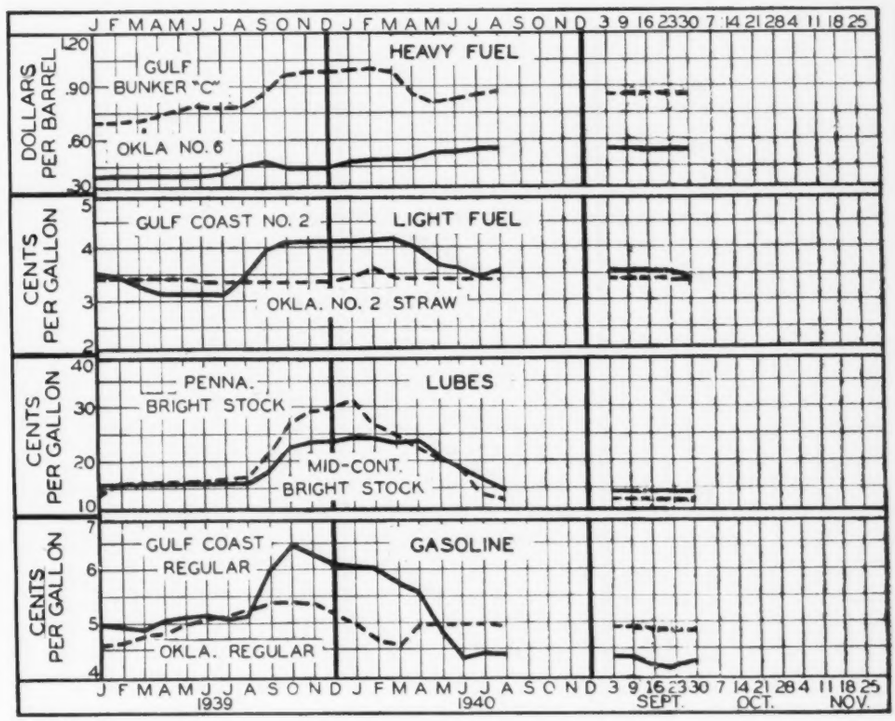
Runs to Stills, Pennsylvania

Crude Oil*

Week Ending	Daily Average	Week Ending	Daily Average
Dec. 30, '39	86,825	May 11	75,639
Jan. 6, '40	83,037	May 18	74,294
Jan. 13	75,756	May 25	77,475
Jan. 20	78,145	June 1	75,638
Jan. 27	81,885	June 8	73,985
Feb. 3	75,662	June 15	75,719
Feb. 10	82,412	June 22	74,230
Feb. 17	81,039	June 29	78,823
Feb. 24	85,515	July 6	67,557
Mar. 2	82,435	July 13	72,761
Mar. 9	69,410	July 20	68,571
Mar. 16	83,034	July 27	66,147
Mar. 23	85,584	Aug. 3	59,937
Mar. 30	83,349	Aug. 10	65,942
April 6	75,350	Aug. 17	68,601
April 13	78,417	Aug. 24	69,800
April 20	79,619	Aug. 31	72,776
April 27	77,820	Sept. 7	58,516
May 4	74,459	Sept. 14	64,723
		Sept. 21	68,242

*Compiled by National Petroleum Association.

REFINERY TANK CAR PRICES



World Crude Oil Supply, Demand and Stocks*

	June 1940	July 1940	% Change 6 Mos. 1940 Over 6 Mos. 1939	% Change 7 Mos. 1940 Over 7 Mos. 1939
NEW SUPPLY OF ALL OILS	(thousands of bbls.)			
Crude Oil Production	111,690	113,244	+10.3	+ 9.1
Natural Gasoline Production	4,401	4,684	+ 6.0	+ 6.9
Benzol Production	263	279	+45.9	+45.9
Total Domestic Production	116,354	118,207	+10.2	+ 9.1
Crude Oil Imports	3,688	3,981	+16.1	+19.2
Refined Products Imports	2,998	2,661	+60.1	+50.0
Total New Supply	123,040	124,849	+11.3	+10.1
DEMAND FOR ALL OILS				
Domestic Demand	106,416	105,876	+10.3	+ 9.6
Crude Oil Exports	5,692	5,607	—24.4	—24.2
Refined Products Exports	8,516	6,219	—25.8	—27.1
Total Demand	120,624	117,702	+ 5.3	+ 4.6
STOCKS OF ALL OILS				
Pipe Line and Tank Farm Crude	193,860	195,488	— 7.7	— 5.1
Producers Crude	11,607	11,213	+ 2.5	— 8.2
Refiners Domestic Crude	53,452	53,360	+ 9.4	+ 7.3
Total Domestic Crude	258,919	260,061	— 4.2	— 2.9
Total Foreign Crude	3,052	3,437	+ 2.2	+28.5
Total Refinable Crude	261,971	263,498	— 4.2	— 2.6
Heavy Crude in California	13,334	13,204	— 6.1	— 8.1
Refined Products Total	283,905	289,071	+ 3.8	+ 3.5
Natural Gasoline	7,000	7,584	+ 3.7	+ 6.5
Total All Stocks	566,210	573,357	— 0.3	+ 0.3

*Compiled by N. P. R. A.

Mid-Continent Lube Statistics—August 1940

(Reported by Western Petroleum Refiners Ass'n. covering operations of 12 member companies.)

	Bright Stock	Viscous Neutrals	Paraffin Oils	Steam Refined Stocks	Blended Oils
Production	120,087	157,647	39,994	19,246 (a)	188,299
Shipments:					
Domestic	106,102	164,372	47,325	25,602 (a)	162,054
Export	17,608	5,473	.....	570 (a)	24,986
Total	123,710	169,845	47,325	26,172 (a)	187,040
Inventory, Aug. 31, 1940	372,637	282,881	51,815	74,204 (a)	126,446
Inventory, July 31, 1940	376,260	295,079	59,146	81,130 (b)	125,187
Inventory, Aug. 31, 1939	337,009	165,202	48,920	134,389	137,685

(a) New basis of reporting, comparable only with data reported in preceding month.

(b) New basis of reporting, not comparable to previous data.

United States Kerosine Statistics

	June 1940	July 1940	% Change 6 Mos. 1940 Over 6 Mos. 1939	% Change 7 Mos. 1940 Over 7 Mos. 1939
Stocks, at First	5,309	6,810	— 2.9	— 2.9
Stocks, at Close	6,810	8,191	—14.3	— 7.5
Stocks, Change	+1,501	+1,381	....	....
Output	5,785	5,797	+ 7.8	+ 7.7
Demand for Domestic	4,284	4,416	+10.5	+ 9.1
Imports	.....	68	....	*
Exports	332	227	—38.5	—44.0
Domestic Demand	3,952	4,257	+16.6	+16.4

*No Imports corresponding period 1939.

Oil Man Heads Controllers Institute Of America

Verl L. Elliott

● Verl L. Elliott, recently-elected president of the Controllers Institute of America, has been allied with the accountancy side of oil business since his graduation in 1921 from the Wharton School of Accounts and Finance, University of Pennsylvania.

Born March 30, 1894, at Edna, Kans., Mr. Elliott, at the age of 23 commenced four years of service, 1917-21, with the Ordnance Department of the U. S. Army. In 1921, he started with Atlantic Refining Co. as an accountant and in 1926 was appointed controller.

Mr. Elliott is past president of the Philadelphia chapter of the Controllers Institute of America, and held the same office in the Philadelphia chapter of National Office Management Assn. He has been a director of Philadelphia chapter of the National Assn. of Cost Accountants and a member of American Petroleum Institute's Committee on Uniform Methods of Oil Accounting, serving as chairman from 1932-35.

Married to a home-town girl, Edith Conrad, in 1915, the Elliotts have two children, Stephen, 18 and Alice Gertrude, 16. An owner of a Guernsey cattle farm in Chester county, near Valley Forge, Mr. Elliott views the range, so to speak, while enjoying his favorite recreation, horseback riding.

For advancement of technical and other interests to controllers, the Controllers Institute of America was founded in 1931. Membership is open only to controllers and assistant controllers when sponsored by their superiors. To date, there are more than 1400 members.

NATIONAL PETROLEUM NEWS

VOLUME 32 — WEDNESDAY, OCTOBER 2, 1940 — NUMBER 40

Suit Filed Against 22 Majors and A. P. I.

Magnolia Advances Tank Wagon Prices

DALLAS, Sept. 30. — Magnolia Petroleum Co. announced last week that effective Sept. 25 it advanced its tank wagon gasoline and kerosine prices in north, west and Panhandle areas of Texas.

At marketing points in the general area where tank wagon price of house brand gasoline was 13.5c or higher, posting was not changed; but where t. w. price was 13c, price was advanced 0.50c; where t. w. was 12.5c or less, price was advanced 1c.

Where tank wagon price of third grade gasoline was 11.5c or less, posting was advanced 0.5c.

Where tank wagon price for kerosine was 8c or higher, price was not changed; but where t. w. price was 7.5c, posting was advanced 0.5c; where price was 7c or less, posting was advanced 1c.

The changes by Magnolia cover virtually the same area as that included in Continental Oil Co.'s Sept. 24 advance, with a few extensions.

Humble To Make TNT For Defense Program

N. P. N. News Bureau

NEW YORK, Sept. 30.—Negotiations between Defense officials and Humble Oil & Refining Co., for the construction of a large plant to produce nitration grade toluol have apparently been successful, it was reported here today. Although no contract has been signed, both parties were said to have agreed in principle on all points. President Roosevelt's approval will be necessary before final steps can be taken, it was believed.

Under proposal made by Humble, the government would finance building of the project and Humble would operate it under a fixed management.

Sunset Pleads 'Nolo' In West Coast Suit

N. P. N. News Bureau

LOS ANGELES, Sept. 28. — Sunset Oil Co. has filed a *nolo contendere* plea in the West Coast anti-trust suit and was fined $3000 by Federal Judge Paul J. McCormick.

Thompson Still Silent On Coordinator Report

Special to N.P.N.

AUSTIN, Sept. 30. — Texas Railroad Commissioner Ernest O. Thompson today declined to affirm or deny reports that he will be selected Federal Oil Coordinator for this section of the nation.

The rumor, current in oil circles, has it that under the National Defense Program, a temporary Federal control of the oil industry can be assumed without any legislation, federal or state.

Oil State Governors Confer With FDR

N. P. N. News Bureau

TULSA, Sept. 30. — Gov. Leon Phillips, Oklahoma, and several other southwestern governors over the week-end were reported enroute to Washington to confer with President Roosevelt and the National Defense Advisory Commission. This conference may tie in with reports of some sort of "emergency" federal oil control being set up, it was reported.

Gigantic Case Charges Price-Fixing And Control Of Production, Refining

(Complete Text of Complaint and List of 367 Defendants, beginning Page 21.)

N. P. N. News Bureau

WASHINGTON, Oct. 1.—Justice department's long-awaited "divorcement" suit has been filed in federal district court here but without specific request that the court separate transportation and marketing facilities from control of the major companies.

Suit lists as defendants 365 oil companies, the American Petroleum Institute and the Ethyl Gasoline Corp. This includes 22 major companies and 344 of their alleged subsidiaries, with a number of local oil companies listed and described as affiliates of one or more major oil companies.

Seventy individuals, connected with defendant oil companies and described as prominent in A.P.I. activities, were mentioned in the bill of complaint but not named as defendants.

Suit is a civil action, not a criminal indictment like in the Madison oil cases.

Bill of complaint covers 61 pages (complete text is published in this issue, beginning on Page 20). Complaint blankets the entire industry, from coast to coast and from producing well to filling station pump.

If suit is successful, according to Attorney General Jackson, independent producers will receive higher prices for their crude, independent refiners should be able to compete with the major oil companies, and all products should be available to the consumer at lower prices (see text of Mr. Jackson's statement on background of the case published elsewhere in this issue).

Additional objectives of the suit, according to provisions of the complaint, are longer margins for jobbers, distributors, commission agents and service station operators; protection of cut-price operators from alleged pressure by major companies and assurance of supply for trackside and other price-selling outlets.

Basic theory of government's case is that the major companies dominate the entire industry. Charges range from "monopolizing" of oil reserves underground, control of production, manipulation of crude prices, misuse of pipeline's common carrier privileges, restriction of refinery output and continuing down to dictating prices at which jobbers and dealers sell.

A.P.I. Dissolution Asked

Through the A.P.I. reports on production and refinery operations, plus alleged suggestions as to cutting down runs and drawing on stocks, it is charged that the defendant companies restrict crude production and refinery output to less than otherwise would be produced with a view to putting a floor under prices.

Dissolution of the A.P.I. is one of the "prayers for relief" at conclusion of the bill of complaint.

The suit charges that the major companies, in addition to their "excessive" profits from pipeline operations, also have

Jackson Gives His Version Of Background of Oil Suit

N. P. N. News Bureau

WASHINGTON — Following is text of statement by Attorney General Jackson giving department's version of "background" of the oil anti-trust suit:

Extent of Control of the Industry

These defendant major oil companies own or control at the present time sixty per cent of the investment in the industry, sixty-eight per cent of the crude oil reserves, fifty per cent of the production of crude oil, ninety-two per cent of the stocks of crude oil, seventy-nine per cent of the crude oil storage capacity, ninety per cent of the imports of crude oil, eighty-five per cent of crude oil trunk pipeline mileage, ninety-six per cent of the crude oil transported in trunk pipelines, seventy-six per cent of the crude oil refining capacity, eighty-seven per cent of the cracking capacity, eighty-five per cent of gasoline production, ninety-five per cent of the exports of gasoline, ninety-six per cent of gasoline pipeline mileage, eighty-seven per cent of the dead weight tonnage of oil tankers, eighty-eight to ninety-three per cent of the stocks of the principal petroleum products and seventy-five per cent of all the bulk plants and service stations.

Reasons for Institution of Suit

This proceeding is being instituted under the Department's policy of taking up in a single investigation or proceeding all of the restraints which affect the distribution of a product from the raw material to the consumer. Only in this way can economic results be achieved. Piecemeal prosecutions against segments of an industry are both costly and inconclusive. They do not raise the fundamental issues which the Court

(*Continued on page* 20)

"connived" with the railroad officials to establish and maintain high freight rates to detriment of the independent refiner.

Getting down to the marketing end of the complaint, it is charged that defendant companies have obtained control over "practically all of the thousands of bulk plants located in the U. S." Such "control" was allegedly obtained through exclusive dealing contracts and by forcing independent refiners, jobbers and distributors to sell or lease their bulk plants to defendants.

Defendants are further charged with "conspiring to distribute their products only through service stations operated by persons, firms and corporations whose buying, selling and operating policies defendants are able to control."

Says 'Iowa Plan' Was Conspired

The "Iowa Plan" of marketing through lessee operators was put into effect and maintained as result of unlawful combination and conspiracy, the complaint charges. Control of leased stations is allegedly through short-term cancellation clauses in leases. It is charged that prices of such lessees are dictated by their supplying company.

Court is asked to declare that leasing contracts and other arrangements, allegedly used to assure exclusive handling of supplier's complete lines of products and accessories, are a violation of the Clayton anti-trust act and permanently enjoin their use. Objective, apparently, is to open up all outlets to any brands and products that the operator of the station—leased or not—desires to handle.

For non-lessee station operators, jobbers, distributors and commission agents, it is charged, defendants "combined and conspired" to adopt uniform contracts requiring these resellers to buy all their requirements from the supplying company.

At "frequent meetings" held under auspices of the A.P.I., its marketing committee and subcommittees, the complaint charges, agreements are reached on sales prices, marketing and price policies and methods of stabilizing prices and raising or lowering them.

It is charged that entire oil price structure is based on a "pricing formula" of which the basic factor is either spot markets or other base points "arbitrarily selected" by defendants for which certain (unnamed) trade journals publish such quotations. Jobbers are charged the all-rail freight rate regardless of shipping point or whether shipment was by non-rail transportation facility or result of exchange arrangements.

"Buying programs", which was the basic charge in first Madison oil case, have been organized in California, Wyoming, Montana, Texas, Louisiana, Oklahoma, Kansas, Arkansas, Kentucky, Illinois, Michigan and Pennsylvania according to the complaint. It is alleged that, in order to manipulate spot market prices, the defendants buy, "at agreed-upon artificially high and non-competitive prices", quantities of products mostly from independent refiners who sell in the spot market and elsewhere at prices below those fixed by defendants.

"Defendants cause such sellers (mostly independent refiners)," the complaint adds, "to report to the trade journals the high, fixed prices paid by defendants rather than the lower spot market prices at which the sellers sell to purchasers other than the defendants. The reporting of the agreed-upon high prices paid by the defendants misleads the trade journals and causes them to publish the fixed spot market prices rather than the lower competitive prices at which gasoline and other petroleum products are being sold currently, thereby making effective and maintaining the fixed, high prices agreed upon by the defendants."

Other Charges

Other charges in the suit, briefly, were:

That defendants have promoted corporations and voluntary membership organizations among independent refiners to facilitate defendants buying activities.

That defendants concertedly fix and maintain excessive price differentials between various grades of gasoline.

That defendants cause a selected defendant to post and publish the agreed-upon prices for sale in tank car, tankwagon, barrel and gallon lots (listing companies and marketing territories in which they post the alleged agreed-upon price).

That defendants and Ethyl Gasoline Corp. agreed that Ethyl prohibit use of tetraethyl lead by non-defendants except with approval of defendants.

That defendants concertedly fix and maintain prices at which they require their jobbers, distributors and station operators, buying for resale, may sell.

That defendants concertedly fix margins for such resellers by agreeing upon differentials between such agreed-upon prices and the prices at which defendants sell.

That these progressively-lower margins prevent jobbers, distributors, commission agents and station operators from competing with the defendants and with each other at prices lower than those fixed by defendants.

That defendants make periodic inspections to surveys of prices posted and charged to ascertain which jobbers, distributors, trackside and other stations are selling at prices lower than those posted by defendants.

That price-cutting sellers are threatened with having their supply cut off in order to compel them to sell at prices set by defendants.

That defendants concertedly designate in various localities a defendant to supply a service station at prices below those fixed by defendants in order to eliminate independent competition and "stabilize" local prices without lowering tank wagon market.

That defendants are eliminating independent trackside stations by concertedly forcing railroad companies to refuse new leases, etc., on trackside sites.

That defendants sell to so-called commercial consumers at fixed prices lower than those fixed by them in sales to jobbers and other resellers taking identical products in similar quantities.

That defendants, in bidding for public or private contracts, fix prices to be bid and select the defendant who is to be low bidder.

That each of the 22 integrated major companies is a vertical combination possessing great economic power including power to stifle effective competition by non-integrated companies.

Dissolution of Institute Is Among Relief Requested

Briefly, the oil suit asks the court for the following relief:

That the A.P.I. be dissolved.

That provisions of exclusive dealing contracts be declared a violation of the Clayton anti-trust law.

That defendants be enjoined from dominating operating and price policies, directly or indirectly, of marketing facilities by means described in the complaint or any other means.

That alleged discriminatory contracts among competing service station operators (probably including the differential allowed 100% stations) and any similar provisions be enjoined.

That defendants be enjoined from entering into any combination to fix, raise, lower or stabilize prices at which defendants buy, sell or require others to sell petroleum products.

That defendants be enjoined from entering into or carrying out any contract or conspiracy to maintain prices.

That defendants be enjoined from operating common carrier pipelines as private carriers.

That defendants be enjoined from inducing railroads to establish rates which are disadvantageous to competitors, coercing railroads to eliminate trackside stations, using bogus independents to eliminate competitors, and any other activity which would have the effect of impairing ability of such competitors to compete with defendants.

That defendants be enjoined from organizing any committee or other group to supervise any of the alleged illegal practices named in complaint or any others resulting from concerted action of defendants.

That combinations and conspiracies to monopolize petroleum industry, alleged in bill of complaint, be enjoined.

That further acquisition of crude oil reserves for purpose of monopolizing reserves be enjoined.

That defendants be enjoined from reducing and restricting amounts of crude oil and products produced.

That defendants be enjoined from any attempts to fix, raise or lower crude oil prices in any manner.

That plaintiff (government) have such further relief "with respect to the organization, functioning and operation of the defendants as the court may deem proper."

That the plaintiff recover costs of suit.

C. S. Holmberg Dies

C. S. Holmberg, Springfield, Ill., died Sept. 20 at his home. Mr. Holmberg was president of the North American Gasoline Tax Conference and supervisor of the motor fuel tax department of Illinois. He leaves a widow.

* * *

Louis Biber

Louis Biber, Detroit, father of Max Biber, attorney for Citrin-Kolb Oil Co., died recently. Mr. Biber, senior, was prominent in the dry goods and clothing business.

THE EDITOR'S PAGE

Readers Comments and Opinions will be much Appreciated by—WARREN C. PLATT, Editor and Publisher, Penton Building, Cleveland, O.

The New Deal Begins its "Blitzkrieg" To Seize the Oil Industry

The New Deal's "complete blitzkrieg" to bring the oil industry under its full control has at last come out in the open.

The attack is simultaneously in the courts and in Congress and it began this Monday. As the New Deal's Attorney General files a petition of blanket charges against major oil companies under the Sherman Act, he also calls on Congress to legislate for "conservation" in the interest of the consumer and of this country's war defense.

Then, in an accompanying statement, he says that the New Deal intends to end the oil industry's "wasteful, inefficient and uneconomic" distribution system and that product prices must come down, not only in the interest of the consumer but, he again reverts, in the interest of our war needs. He seems to express a decided preference for "price sellers."

The more one studies this latest attack in connection with the New Deal's past attacks and relations with the oil industry, the more certain it appears that the New Deal is not moving to right any wrongs in the industry's operations, not seeking to adjust industry practices to eliminate any evils, so much as it is trying to create circumstances that will give it actual operating control. That it is operating control the New Deal seeks is best shown by the details and hidden powers in the bill that Roosevelt and Ickes had introduced in Congress a year ago and which is still pending despite the practically unanimous opposition of oil men and oil state officials. It is obviously the creation of the powers sought in this bill, for which the New Deal's Attorney General now calls on Congress.

The charge has been made many times by many people that since the New Deal got into office and found the oats, that it has been heading this country straight for socialism and totalitarian government. The New Deal has stepped on many toes and made many enemies who have contributed to the burst of these charges. And today a great political campaign is being fought on them.

So it is hard to discuss this latest attack on the oil industry without opening one's self to the accusation of being political, or, according to one's position, to being "reactionary." Name calling in politics has been much the vogue especially during this New Deal era and there has been plenty of it also in the oil industry. You, the reader, will look upon this suit of the New Deal's against the 22 major oil companies, probably according to how you have fared in competition with them. And you, the reader, engaged in oil production, will look upon the move to get "conservation laws" at Washington, according to whether you like to operate in Illinois for instance, with all wells flowing wide open or in Texas where your investment and the country's reserve oil supply, will actually be conserved by state law.

Oil is Vulnerable, As a Natural Resource Industry

But, as has been said many times by this paper, one should look upon all government moves against the oil industry in a different light than those against other industries. Oil is a natural resource that is not being replaced, so far as we know, by nature. The owner of the oil land's surface has had nothing whatever to do with creating the oil or placing it under his land. Practically all other oil countries have long since declared not only direct government interest but even government ownership of oil no matter under whose land it may lie.

A good bit of our present civilization is built on the internal combustion engine. To run out of fuel for that engine, in the absence of discovering any other power, would be a tremendous calamity to all. Today's war, and any country's defense, is absolutely dependent on such engines and their fuel.

Because of the laws governing our ownership of land, it has been found necessary for government to aid the oil industry in its increasingly better recovery of crude oil from the ground. As the engineering of oil finding and production has improved, it has been necessary to have more help from government in order to make that engineering efficient and to prevent waste of this natural resource.

So far this government aid has been furnished by state governments where the oil is produced. This aid has been supplied through a process of evolution in courts, in hearings and in personal arguments. But out of it all has come a quite fair and efficient administration of the state's interest—acting for all the people, consumers and other land owners.

The oil industry went to Washington in 1933 because this state aid had not been worked out as well as it since has and because states can be materially assisted in their conservation efforts if the federal government prohibits the interstate transportation of oil produced in violation of a state's orders.

At first the New Deal paid shockingly careless attention to the problem of the oil industry and then it gave most inefficient aid to the states. But finally the great possibilities of what control could be exercised over the oil industry by the federal government began to dawn on the New Deal. Then came government anti trust suits and finally in 1939 the Ickes-Roosevelt oil control bill. This was introduced in the name of "conservation" but any reading of the bill shows its far reaching intent, despite the denials of both Roosevelt and Ickes. The language is there no matter what they say.

This oil control bill sought to put in the hands of one man in Washington all, and more, of the powers exercised by the oil states. The state conservation officials would have been superseded completely and in addition there would have been vested in this one man at Washington the power to declare not only what oil operating methods are "wasteful" but also what uses of petroleum products are "wasteful."

Naturally the oil state officials fought this effort to steal their control of their states' resources and fought the giving up of this political and economic power. Also oil men opposed the bill because they believe it better to keep that governing power close-to-home than have it a few thousand miles away.

The bill was seemingly practically dead.

Starts Fears for Sufficiency Of War's Oil Needs

Now comes the threat of war to this country, a new type of war fought, one might say, more with gasoline and the internal combustion engine, than with powder and guns. "Democracy" is plentifully supplied with gasoline while the "dictators" have little and may run out before they can achieve further victories.

One can hardly expect the New Deal to pass up such an opportunity to take control of a vast industry as oil. Attorney General Jackson, in answering Senator Gillette's inquiry as to what is going to be done with his oil suits, comments on a statement of the National Defense Commission that "the country's oil reserves are good for more than 10 years under emergency conditions" by saying "the very fact that in considering national defense we begin to calculate the life of our oil reserves in such small figures is an ominous sign for national defense and for our economic life."

With war all around us, the New Deal also has another argument that may permit it to over-ride oil state conservation; to wit, it is the federal government that is prosecuting war defense and not the individual states so control of such an important war supply as oil should be in the hands of those at Washington.

Also once the New Deal has taken over the oil industry in the name of war defense, and the New Deal is already operating the coal industry and all the

farms, it might not be such a shock to the general public when the New Deal moved for more control over other industries.

"Majors" Should Fight For Their Liberty, not "Appeasements"

That the New Deal was moving for this control by threatening the industry with this latest law suit, is shown by the secret negotiations that Ickes undertook with a handful of oil men to see what the major oil companies would accept in the way of government control if he could get the administration to drop the suit. Why these negotiations fell flat is still a mystery but perhaps it was reports from practically all, if not all of the majors even though they were kept in ignorance of the proposed deal, that they would rather risk a legal fight in New Deal controlled courts than sign away their liberty and that of the industry.

We hope that courageous independence of action will be the course that the major oil companies will pursue in fighting this case. We hope that there will be no "appeasements", no "consent decrees" no "nolo contendere" pleas but that all the issues will be fought out in court and before the people.

In fact as this case holds so much of all industries' future as well as the future of the American form of government, and as the case as drawn is palpably a political one, we hope the major oil companies will disregard the time honored practice of making their defense only in court, but will start in right now to tell their stories to the oil industry and to the public. This procedure is justified because the government has already presented its case to the public not only through the petition but through its "digest" of the petition and a "background" statement by the Attorney General, and in pushing its proposed legislation, the government will tell more of its story.

In the meantime we of NATIONAL PETROLEUM NEWS will endeavor to bring all the arguments, pro and con, on this most striking issue to all of our readers. We will try and help them to analyze both stories. We will help them to find the untruths and there are many of them in the government's press statement of the petition and of the attorney general's "background" remarks.

But above all we urge all readers no matter which side of the many oil industry controversies they have been on, to study the whole picture and not be content with seeing their own individual part of it, for there is far more in this case and the proposed legislative drive than "getting even with the majors" or possible correction of pipeline rates or settlement of other industry controversies.

In fact, a study of the papers made public so far show clearly and quite frankly that the New Deal is not interested in the industry's welfare, nor the profits and business of the small oil man who has complained to it. These papers show quite plainly that, as Attorney General Jackson says, the New Deal is going to eliminate "waste," "inefficiency" and "uneconomic practices" in oil marketing and drive for lower prices to the consumer, while paying higher prices to the crude oil producer and at the same time "permit" the Independent refiner to live and compete. The Attorney General also talks against national brands and quite apparently seems to be for more price sellers.

How the New Deal is going to accomplish all this without taking it out of the hides of marketers and dealers will be nothing short of a miracle.

But however the reader may view the details there can be no doubt that this industry is faced with the most serious possibilities in its history, possibilities that confront not alone the 22 major oil companies named in this law suit, but that confront every last individual oil man, no matter who he is, possibilities that call for the most serious study of the facts of the times and the clearest thinking.

OIL TAX NEWS

Gasoline Taxes Will Zoom; See $1,032,000,000 for 1940

NEW YORK, Sept. 28.—U. S. motorists will pay approximately $1,162,000,000 in gasoline taxes during 1940, Baird H. Markham, director of American Petroleum Industries Committee estimated this week.

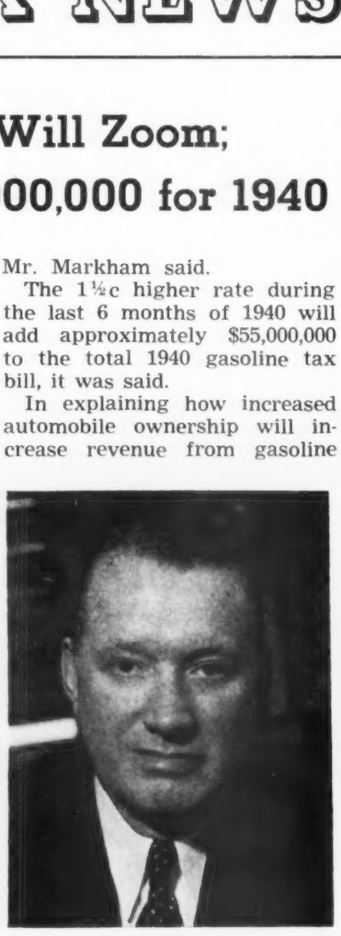
Increase of 1½c in federal gasoline tax, increased automobile ownership, and the greater use of automobiles by their owners will shove the nation's gasoline tax burden up $130,000,000 over the $1,032,000,000 collected in gasoline taxes during 1939, he said.

"The chief factor in the estimated $130,000,000 increase in the 1940 gasoline tax bill is the higher federal tax on gasoline. This tax, which was inaugurated by Congress in 1932 as a 'temporary' measure duplicates the taxes of the states.

"In 1939, the federal gasoline tax, collected at the rate of 1c per gal., yielded approximately $215,000,000 of revenue, or more than the total of all other manufacturers' excise taxes collected by the federal government," Mr. Markham said.

The 1½c higher rate during the last 6 months of 1940 will add approximately $55,000,000 to the total 1940 gasoline tax bill, it was said.

In explaining how increased automobile ownership will increase revenue from gasoline taxes, Mr. Markham pointed out that there are approximately 1,500,000 more automobiles on America's highways now than at this time last year. Motorists are also making more use of their automobiles, average mileage of motor vehicles so far this year having increased 3% over the same period last year, it is estimated.



Baird H. Markham

Tennessee May Lose U. S. Highway Funds

N. P. N. News Bureau

CLEVELAND, Sept. 30.—Unless Tennessee can explain the apparent diversion of $1,000,000 collected from the state's automobile registration fees, it stands to lose part of its federal highway allotment, reports the U. S. Public Roads Administration.

The Tennessee legislature provides for 10% conversion of the state's automobile registration fees into the general fund to reimburse other departments for work allegedly done in behalf of the highway department.

At present, the Public Roads Administration is endeavoring to determine whether this conversion can be classed as diversion under the Hayden-Cartwright Act, which provides a maximum penalty of one-third of a state's federal road allotment for diversions exceeding those existing when the act was passed.

States already penalized for highway fund diversion are Massachusetts, and New Jersey, losing $472,862 and $250,000 respectively.

Florida Court Upholds Use Fuel Tax

NEW YORK, Sept. 30. — The Florida use fuel tax, enacted by the 1939 legislature to cover distillates used for propulsion of motor vehicles on the highways, has been upheld by the Florida Supreme Court.

Validity of the act was challenged by Acme Freight Lines, interstate carrier, on the grounds that the tax was a burden on interstate commerce. The court held that the tax was intended merely as compensation for use of public roads in the state and was, therefore, valid.

Kentucky Marketers to Meet

LOUISVILLE, Oct. 1.—Dates for the Fifteenth annual meeting and convention of the Kentucky Petroleum Marketers Assn. have been set for Feb. 11 and 12 at Brown Hotel, Louisville, states Herbert L. Clay, secretary.

WITH THE ASSOCIATIONS

Marketers in Indiana Plan Oct. 9 Meeting

N. P. N. News Bureau

CLEVELAND, Oct. 1.—When members of the Indiana Independent Petroleum Assn. meet at Indianapolis' Hotel Severin, Oct. 9, one of the principal speakers will be Samuel B. Pettengill, former Indiana congressman, who is regarded as a foe of federal oil control.

Mr. Pettengill is a former Indiana congressman who served on the famous Cole subcommittee investigating the U. S. oil industry. He is also author of several books, including "Hot Oil" and the recent publication "Smoke Screen."

Another address will be given by Ralph W. Carney, supersalesman, who will talk on "Welding the Weakest Link." Homer L. Chaillaux, "the man who rung the rafters" at the association's meeting last year, will also speak. Mr. Chaillaux is national Americanism director of the American Legion and is known as spearhead of the legion's war against all subversive and un-American activities.

Film To Be Shown

R. A. Ludlow, director of the lubrication committee of the American Petroleum Institute, will also speak. The slide film, "Recommended Practice for Crankcase Oil Change" will be shown and an open forum held on the subject, if desired by the marketers.

N. Bond Hedden, Chicago, Ethyl Gasoline Corp., is scheduled to speak about farm trade and the 50% increase in total number of farm tractors in use on U. S. farms since the introduction of the automotive-type tractor.

Suppliers have been contributing to a fund for a cocktail hour to be held in the Hotel Severin's Rainbow room, at 5:30, Oct. 9. A free bar will be maintained and entertainment furnished. Following cocktail hour, the banquet will be held on the hotel roof.

J. E. Fehsenfeld
President of I. I. P. A.

'Old-Time' Oil Men Planning Own Club

N. P. N. News Bureau

CLEVELAND, Oct. 1.—"Days of Our Years" might be the theme of 99 "old-time" Indiana oil men who have amassed 2030 years of work in the oil industry, and plan to organize an Old-Timers Club at the fall meeting, Oct. 9, of the Indiana Independent Petroleum Assn.

George W. Hofmayer
Secretary of I. I. P. A.

The Hoosier state's old-timers have shown much enthusiasm toward forming a club, reports R. G. Clark, "old-time" organizer and president of the Hi-Power Petroleum Corp. Indianapolis.

Other old-timers interested in becoming members, have been asked by Mr. Clark to send either a postcard or letter to the I. I. P. A., 807 Union Tile Bldg., Indianapolis, or to R. G. Clark, 300 North Belmont Ave., Indianapolis, with the following information: "How long have you been in the petroleum or the petroleum equipment business? With what company were you affiliated? In what capacity? Do you expect to attend our banquet Wednesday evening, Oct. 9, 6 o'clock, Hotel Severin, Indianapolis? Would you like to form an Old-Timer Club?

Will Organize Thursday

At the Wednesday night banquet, the old-timers will be introduced, and the following morning will have an opportunity to organize, states Mr. Clark. This meeting will probably be held in the Rainbow room on the street floor, he said.

While more than 99 old-timers so far have signified their desire to join such a club, some of them did not give their years of service, Mr. Clark reports. However, the following list names men known to have 15 or more years of service in the oil business:

W. J. Lang, 40; N. R. Davidson, 35; A. D. Miller, 35; Claude W. Price, 33; R. D. Scott, 33; C. C. Blinn, 32; W. H. Trimble, 31; J. E. Fehsenfeld, 30; Fred Borders, 29; Allen Tremper, 29; R. D. Collins, 26; W. E. Kennedy, 26; George H. Lilly, 26; W. E. Peck, 26; Robert Schrader, 26; T. C. Pike, 25; E. E. Lee, 25; R. D. McClaren, 25; H. P. McCoy, 25; J. S. Maidlow, 24; J. M. Franks, 24; S. A. Warren, 24; W. E. Armstrong, 24; R. B. Denham, 24; and Julius Malkemus, 23.

G. E. Barnes, 22; Paul Durham, 22; H. R. Fabyan, 22; A. P. Scott, 22; E. W. Waltke, 22; George Burns, 21; Charles F. Gerber, 21; Ralph Hofthein, 21; Henry Strauss, 21; L. V. Surtees, 21; Willard Colter, 20; W. H. Crumley, 20; S. H. Davis, 20; Paul Deer, 20; M. H. Duffield, 20; William R. Dust, 20; Frank S. Glenn, 20; Fred E. Humphrey, 20; H. A. Lang, 20; W. P. McFatridge, 20; Harold R. Orbaugh, 20; Harry B. Smith, 20; George Speaker, 20; Glen Thatcher, 20; and E. P. Clark, 19.

Roy Goddard, 19; C. W. Huber, 19; H. Ralph Huey, 19; C. B. Kauff, 19; F. B. Robbins, 19; B. L. Snyder, 19; John R. Burke, 18; Marion Coulter, 18; R. W. Eckert, 18; J. H. Patterson, 18; Charles Weise, 18; Phil T. Williams, 18; R. S. Williams, 18; Lewis Bell, 17; Harry Atkinson, 17; and Herbert F. Davis, 17.

L. E. Downing, 17; J. P. Franz, 17; George F. Kurtz, 17; Earl Storm, 17; L. W. Stuckey, 17; R. M. Stith, 17; D. C. Speer, 17; I. L. Beeler, 16; Frank E. Blackford, 16; H. J. Hambright, 16; Owen Jones, 16; Herman Keys, 16; Norman Polk, 16; Lawrence Polk, 16; F. B. Dyer, 16; Joseph S. Anderson, 15; R. J. Byroad, 15; J. R. Carr, 15; C. E. Close, 15; and W. J. Dickson, 15.

Reed Devaney, 15; Earl Fisher, 15; Waldo S. Huffman, 15; Joe Kohr, 15; V. J. McBride, 15; Ernest Mears, 15; C. H. Maston, 15; H. F. O'Gara, 15; N. E. Reed, 15; D. C. Slagle, 15; R. R. Woodward, 15; Erman B. Yoder, 15; and Oscar Mutti, 15.

Speakers Announced For IPAA Conclave

DALLAS, Sept. 30.—Two national legislators and an internationally known petroleum geologist will be numbered among speakers to appear at the 11th annual meeting of the Independent Petroleum Assn. of America here Oct. 16, 17 and 18, according to report from I. P. A. A.

Hatton W. Sumners, congressman from the Dallas district, will be the featured speaker at the association's annual banquet Oct. 18.

Wesley E. Disney, representative iin Congress from the first Oklahoma district, will speak at the luncheon meeting Oct. 17. He will discuss legislative questions of interest to oil men.

A. I. Levorsen, Tulsa, petroleum geologist and past president of the American Assn. of Petroleum Geologists, will speak on the "Geological Outlook for Future Oil Discovery."

R. G. Clark
Organizes "Old-Timers"

Dedication of monument to mark site of No. 1 Stapleton, discovery well in El Dorado (Kansas) field. Left to right: H. R. Straight, Bartlesville, Okla., president of Cities Service Oil Co.; H. K. Lindsley, Wichita, Kans., director of the Kansas State Historical society, and William G. Skelly, Tulsa, president of the Skelly Oil Co.

Mid-Continent States Honor El Dorado's 25th Birthday

EL DORADO, Sept. 30.—El Dorado, Kans. held the spotlight of oil industry attention last week when Mid-Continent producing states celebrated the 25th anniversary of the discovery of oil in the prolific El Dorado field.

When oil was discovered in the now old Stapleton No. 1 well about the only publicity it got was in the trade journals of the time. Less than three years later, oil that first flowed from El Dorado's Stapleton No. 1 well, was averting a shortage of petroleum that faced the U. S., then entering the first World War.

From a one-well field in 1925, El Dorado produced a reported 29,198,145 bbls. of oil in 1918 to supply the country with one-sixteenth of its war-time needs. And 25 years later (1940) another "world war" sees this old field pumping 7400 bbls. of oil daily to the surface.

More than 3000 people Sept. 26 watched the unveiling of a monument dedicated to El Dorado's No. 1 well. Earlier that day, 7000 observers honored the "old timers" responsible for the discovery and drilling in of the well.

Brennan Honored

From the derrick floor of a 72-foot modern derrick located in downtown El Dorado, James M. Brennan of El Dorado, who helped drill the first well, was honored as "Grand Oil Man of the Reunion." Giles R. Atherton of El Dorado, superintendent of the drilling crew for the discovery well, was named "Grand Old Man of the El Dorado Field." Both were presented with miniature drill bits of silver. Numerous other veterans of the El Dorado field were also honored.

In the dedicatory services at the Stapleton No. 1 well, William G. Skelly of Tulsa, president of Skelly Oil Co. with a refinery at El Dorado, spoke of the ability of the industry to supply the country's petroleum needs.

"The oil industry stands ready and willing to do its part in providing for the national defense. There has been no industry in the U. S. whose development has been more rapid, more successful and more stable than the oil business," Mr. Skelly said.

The former El Doradoan praised Kansas' governor and oil regulatory body for "equitable and fair treatment" of the oil industry in Kansas.

Cites Developments

H. R. Straight president of Cities Service Oil Co., told of the developments in the El Dorado field that made it possible for the "Allies to float to victory on a sea of oil."

"Our courses have been parallel during the past quarter of a century," Mr. Sraight told El Doradoans.

Grease Institute Discusses Industrial Lube Problems

By N. P. N. Staff Writer

CHICAGO, Sept. 30. — The usual technical program of the National Lubricating Grease Institute was reduced to a single technical paper at the eighth annual meeting of institute here today. An audience of close to 100 heard E. S. Glauch, Joseph Dixon Crucible Co., speak on "Graphite—Its Use in Lubricants," at the opening session this morning.

The afternoon session was devoted to discussions of problems met by grease makers in various sections of the country. Speakers were past presidents of the institute.

President E. V. Moncrief, Swan-Finch Oil Corp., opened the convention. He spoke of the progress of the institute since its organization and discussed the use of the institute emblem. While the emblem is not to be used on packages he encouraged a more general use of the emblem on members' letterheads.

One of the principal conclusions of Mr. Glauch was that not only the percentage of impurity in graphite but also the nature of the impurity governs the value of graphite in lubricants.

Graphite as Lubricant

Mr. Glauch explained the effectiveness of graphite as a lubricant by saying that it fills the pores of the bearing and journal and imparts a coating which resists pressures greater than the average oil or grease. He stressed the savings in power in steel rolling mills which were said to run as high as 30% in some instances. Wear in bearings resulting from the use of graphite was attributed to use of low grade product. He said that the artificial variety of graphite was not necessarily superior on account of low ash content because experiments have shown that "even though the natural amorphous grades have higher percentages of impurities the rate of wear is definitely less."

J. R. Battenfeld, Battenfeld Grease & Oil Co., first president of the institute, spoke on "Mechanization Applied to Agriculture" showing its meaning to grease making. He jumped from the period when axle grease comprised all farm sales to the present with farm consumption comprising a complete line of greases for its 1,820,000 tractors and other farm machinery, as well as its millions of cars and trucks.

W. H. Saunders, Jr., International Lubricant Corp., described the "Industrialization of the South," stressing its rapid growth since 1917.

Phenomenal Change

The "Transition in the Iron and Steel Industry" was discussed by M. R. Bower, Standard Oil Co. (Ohio). He said the development and change in steel mill equipment during the last 10 years has been phenomenal but that the grease manufacturer has kept abreast of the times and by persistent research, combined with a study of practical application, has made possible the smooth operation of this ultra modern equipment.

Homer F. Wilhelm, Socony Vacuum Oil Corp., spoke on public relations and employe relations.

A description of the Buffalo area was given by G. W. Miller, executive secretary of the institute. He said a new trade picture for the U. S. would result from the present industrial growth in Eastern Canada where $800,000,000 is being spent in plant construction.

M. B. Chittick, The Pure Oil Co., expressed the view that mechanical development has gone far in advance of grease making technique and that grease makers have turned Oriental because many of their greases have remained unchanged for a great many years.

Kerns Elected Head Of Grease Institute

N. P. N. News Bureau

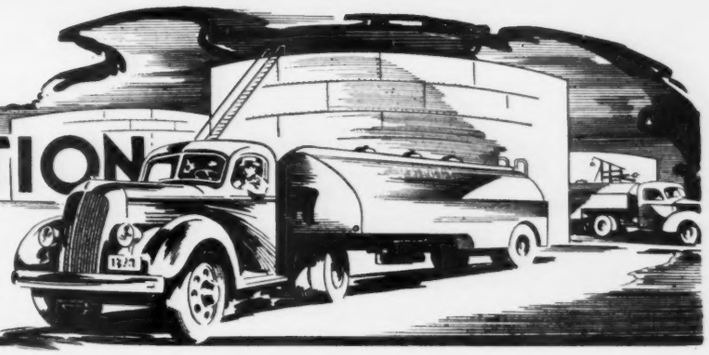
CHICAGO, Oct. 1.—F. C. Kerns, New York, The Texas Co. was elected president of the National Lubricating Grease Institute at the meeting here today, succeeding E. V. Moncrieff, formerly president and treasurer.

Mr. Moncrieff continues as treasurer. Sidney Bevin, Toledo, O., Fisk Brothers Refining Co. was elected vice-president. G. W. Miller, Buffalo, Battenfeld Grease and Oil Corp., was re-elected executive secretary.

All directors of the Institute were re-elected, with the exception of H. G. Vesper, San Francisco, Standard Oil Co. of California who succeeds C. S. Lincoln of the same company.

Carl W. Gorgi, Emlenton, Pa., Enterprise Oil Co. was elected to the directors, succeeding W. E. Callaghan, Jackson, Mich., Motor State Oil & Grease Co., who died several months ago.

OIL TRANSPORTATION



'Clean' Tankers See 2c Increase

N. P. N. News Bureau

NEW YORK, Oct. 1.—Coastwise tanker rates were up again the past week, "clean" tonnage bringing 2c more; "dirty" tonnage, 1c more per bbl. Reports indicated there were no "dirty" bottoms available for October, with "clean" bottoms still scarce for nearby positions.

Fixture of a "dirty" boat at $11.50 per ton for California to Japan was reported. Another boat, fixed for 11,000 tons of crude and/or fuel, Venezuela, Aruba or Curacao to North Hatteras at 20c per bbl. was also reported.

Last paid "clean" rate, Gulf-North Hatteras, was 21c for gasoline, 22c for kerosine, 23c for No. 2 fuel. Light crude was last fixed at 19c, and 10-19.9 gravity fuel at 21c, according to reports. Owners were said to be asking 2c above last paid rates.

Nebraska Pipeline Nears Completion

N. P. N. News Bureau

TULSA, Sept. 30. — Bell Pipe Line Co. is pushing construction of its 4.5 inch gathering system in the Falls City, Neb., field and expects to make its initial run of Nebraska crude through the new facilities by Oct. 10. Bell says it expects to pay 80c a bbl. for the approximately 31.5 gravity oil it will buy.

The pipeline outlet for oil from Nebraska's first oil field will have a capacity of about 10,000 bbls. daily. The gathering system will cover the entire Falls City field, announcement said. Crude will be piped to a nearby Falls City loading rack and rail-shipped to destination.

Oil purchased by the Bell company will be applied against the company's existing contracts now filled from a producing district other than the Mid-Continent. Bell has pipeline systems in Illinois and the Mid-Continent.

Bell Pipeline Co. was organized to handle the Nebraska system, with M. L. Freese as president; B. I. Lubell, vice-president and treasurer; I. A. Anson, director; and Ben Piepgrass, secretary. Officers of the new company will be headquartered at Tulsa.

ICC Calendar On Oil Trucking

DECISIONS

Yellow Star Transfer, Burlington, N. C. (MC-2913). Issuance of a certificate approved, upon compliance by applicant with certain conditions, to continue operations as a common carrier by motor vehicle, of petroleum products in containers from Philadelphia, Pa., to Burlington, N. C., and points in North Carolina within 75 miles of Burlington, N. C., over irregular routes.

HEARINGS

R. B. Wilson, Denver, Colo., (MC 9895, Sub. 7), October 7, Denver, Colo., on application for permit to transport petroleum products between Casper, Wyoming and refinery points in the immediate vicinity thereof, and Alma, Colo.

Hancock Truck Lines, Evansville, Indiana (MC 25567, Sub. 2) October 9, Indianapolis, Indiana, on application for authority to extend operations as a common carrier by motor vehicle in the transportation of petroleum products in tank trucks, in the States of Indiana and Michigan.

Petroleum Transportation Corp., Indiana, and Detroit, Michigan, (MC 50047, Sub. 2), October 18, Detroit, Michigan, on application to extend operations as a common carrier by motor vehicle of petroleum and petroleum products, in bulk, in States of Michigan, Ohio, and Indiana, over irregular routes.

Elton Murrell Chester, doing business as **Chester Fuel & Transportation Co.,** San Jose, California (MC 100971, Sub. 3), on application to extend operations as a common carrier of petroleum products in bulk in tank trucks in States of California and Oregon, over irregular routes; and over regular routes between Hanford, Calif., and Grants Pass, Oreg.; and between Richmond, Calif., and Grants Pass, Oreg., and between Bakersfield, Calif., and Grants Pass, Oreg., via Stockton and Sacramento, Calif.

Frank B. Oswald, doing business as **Baden Equipment Company,** St. Louis, Missouri, (MC 101066, Sub. 2), October 15, St. Louis, Missouri, on application to extend operations as a contract carrier in transportation of petroleum products in bulk in the States of Illinois and Missouri, between St. Elmo and points located within 2 miles thereof, and points located in the St. Louis, Mo., commercial area, over irregular routes.

R. E. Ensminger, doing business as **R. E. Ensminger & Sons,** Holyoke, Colo. (MC 37498, Sub. 4) on application, as amended, to extend operations as a common carrier of bulk petroleum products, in States of Wyoming, Nebraska, and Colorado, over irregular routes

H. M. Melton, doing business as **Melton Transport Company,** Greeley, Colo. (MC 11590, Sub. 4), October 17, Denver, Colo., on application to extend operations as a common carrier of bulk petroleum products, in Colorado, Kansas, and Nebraska over specified routes; and on application (MC 11590, Sub. 5) to extend operations as common carrier of bulk petroleum products in Kansas, Colorado, Oklahoma, and Texas, between Liberal, Kans., and Laverne, Okla., and points located in Texas and Colorado, over irregular routes.

Uniform Rail Rates Sought On Liquefied Petroleum Gas

N. P. N. News Bureau

TULSA, Oct. 1.—In an effort to afford a uniform basis for establishing rail rates on liquefied petroleum gas between points in Texas, rails have proposed a mileage scale of rates virtually identical with that applying on intrastate shipments of gasoline.

Increased movement of L.P.G. from origin points to the Texas Gulf Coast for blending with high anti-knock gasolines have been reported by shippers. Much of this demand has been supplied by trucks, it is said.

A proposal now before the Texas-Louisiana Freight Bureau proposes a 0.396c a gal. rate on Casinghead gasoline and L.P.G. shipped from Cranell and Woodsboro to Corpus Christi for intrastate export and/or coastwise traffic, exclusive of coastwise deliveries through the Panama Canal.

An export-coastwise rate, except coastwise through the Panama Canal, of 1.122c a gal. on L.P.G. from Cranell, Ewelder, Refugio and Woodsboro to Beaumont, Orange and Port Arthur is under consideration by the Texas-Louisiana Freight Bureau. This is same rate as now applicable on natural gasoline shipments between these points, it is said.

Another proposal would establish a 1.617c gal. rate on L.P.G. shipped from Arp and Norfolk, Tex., to Velasco, Tex., where Dow Chemical Works has a plant. This rate is necessary, it is said, if rails are to handle the business.

A 0.594c a gal. rate on isopentane from Baytown to Chaison, Tex., is also proposed. This product is used as a blending stock consisting of L.P.G., natural gasoline and heavier fractions used to improve the distillation characteristics of gasoline and will be placed on the market for that purpose, the application reports. The rail rate would be truck competitive, it is said.

ICC Rate Hearings Postponed, Oct. 21

N. P. N. News Bureau

WASHINGTON, Oct. 1.—Because the Interstate Commerce Commission wants its practitioners to be free to attend the ICC Bar Assn. Convention, date for the hearing in the trainload rate case at Oklahoma City has been postponed from Oct. 8 till Oct. 21, commission officials explained today.

Purpose of the hearing was to meet objections of railroads that they have not had a full or fair hearing heretofore on the application of volume rates for gasoline and natural gasoline.

Pipeline Nears Completion

NEW YORK, Sept. 30. —Socony Vacuum's 6-inch gasoline pipeline which runs from its Atlas Refinery at Buffalo, N. Y., to Syracuse, N. Y. is "nearing completion", the company reports. The new line also branches off to serve Rochester, N. Y., and will eliminate use of the New York barge canal which is closed during the winter.

Jackson Gives His Version Of Background of Oil Suit

(*Continued from page* 13)
should decide, and therefore do not clarify the law. They allow restraints of trade to flourish in one segment of the industry while they are being prosecuted in another.

In the past ten years, the Department has been flooded with complaints from independents and consumers against various practices in the oil industry. These complaints have resulted in a series of piecemeal prosecutions in all of which the government has been successful. Yet in spite of the success of these prosecutions, the complaints continue, prices are still inflexible, independent enterprise is still under a handicap, because the cases applied only to segments rather than to the entire structure of the industry.

For this reason the present action is brought. It will eventually present to the Supreme Court of the United States for final decision all of the issues with respect to the reasonableness of the present vast combinations in the production, transportation, refining and distribution of petroleum products.

Interest of Consumers

The emphasis of this action is not only on the interests of independents but on the interests of consumers who have not as yet benefited from the recent successful prosecutions in the Ethyl Gasoline case and the Madison Oil case. In both of these cases the major oil companies had put a floor under gasoline prices. In the Ethyl case it was established that the differential between regular and high-test gasoline was fixed at 2c in spite of the fact that the difference in cost was far less. In spite of these cases the differential still exists at 2c because of the policies and practices of the defendants and the price of gasoline continues at its present inflexible level.

It is believed that the great advances and technological improvements in the oil industry are not being passed on to consumers because of a wasteful, inefficient distribution system which leads to excessive prices. Through their domination of all phases of the industry the major companies have created a system which has led to identical policies with respect to price and the suppression of free and independent enterprise. That system has given the consumer a wasteful and uneconomic distribution of gasoline, fuel oils, lubricants and kerosine. It has eliminated competing enterprise. It has destroyed the opportunity for new enterprise and capital to enter the field. It has established a small group of individuals in control of a fifteen billion dollar industry under a system where there is no incentive to compete among themselves and every incentive to prevent the entry into the market of those who would otherwise sell to customers at lower prices. This system has closed the door to any new initiative in the oil industry which might disturb the settled policies with respect to production, transportation, refining, and marketing.

The unreasonable power possessed and exercised by the integrated companies has deprived the consumer of natural advantages due to location. It has taken from the consumer the opportunity to purchase a variety of products. It has withheld from the consumer the benefits of technological improvements which should be reflected in lower costs. It has fostered and preserved an uneconomic, duplicative, and wasteful marketing system. And finally the power of the integrated companies has determined the production of oil, necessary for the safety of the nation, not on true conservation principles, but on the principle of price maintenance.

Anticipated Results of the Action

If the Department succeeds in this action, independent producers should receive higher prices for their crude oil, and independent refiners should be able to compete with the major oil companies. With competition restored to the oil industry, gasoline, fuel oils, kerosine and lubricants should be sold at lower prices to the consumer who should then receive the benefits of technological improvements, and the opportunity to purchase a variety of products. Lower prices for petroleum products are of great importance to the government in its defense program. Finally the production of oil should then be determined not on the basis of price maintenance but on true conservation principles.

Additional Suits Under Elkins Act

The principal suit, above described, will be supplemented by three suits; one against the Phillips Petroleum Company and the Phillips Pipe Line Company in the District Court of the United States for the District of Delaware; one against the Great Lakes Pipe Line Company in the same district; and one against the Standard Oil Company of Indiana in the Northern District of Indiana, Hammond Division. These three suits were selected as representative proceedings to clarify the law with respect to all cases where pipe lines are owned by the major oil companies. They charge the major oil companies involved with taking rebates from common carrier pipe lines on the oil which the majors ship. The method by which these rebates are alleged to be taken is as follows: The major oil companies own the capital stock of the pipe line companies, pay the published tariff rates and receive refunds from such rates under the guise of dividends on the stock. During the year 1939, the net earnings of the Phillips Pipe Line Company amounted to 49 per cent of transportation revenues; the Great Lakes Pipe Line Company 49.5 per cent; and the Stanolind Pipe Line Company 36 per cent. These earnings are paid back in the form of dividends to the major oil companies which ship the oil, thus giving the major oil company shippers a tremendous advantage over their independent competitors.

This the Department of Justice contends is an illegal rebate under the Elkins Act.

State Price Law Unconstitutional

Special to N.P.N.

COLUMBIA, S. C., Sept. 30.—South Carolina's price discrimination law on which "Pete" Thornell, Florence chain filling station operator, based his complaint in backing a suit by the state against 5 major oil companies, has been declared unconstitutional by the State Supreme Court.

Decision which upheld the lower court was on a demurrer by the Texas Co., Shell, Sinclair, and Standard Oil Co. of New Jersey. Gulf Refining Co., also named as a defendant, had not filed a demurrer.

The state's complaint was based on allegations of various price discriminations against small filling station owners in favor of private companies buying at wholesale prices. Statute prohibited variations in prices of goods "in common use."

Co-op Group To Meet

CHICAGO, Sept. 30. — When representatives of consumer cooperative purchasing associations gather here for the Twelfth Biennial Congress of the Co-operative League of the U. S. A., Oct. 16-18, more than 40 states will be represented.

Indiana Standard Hikes North Dakota Gasoline

N. P. N. News Bureau

CHICAGO, Sept. 28.—Standard Oil Co. of Indiana announces that its "sub-normal" dealer and consumer tank wagon prices of third-grade gasoline will be advanced to "normal," or by 0.5c throughout North Dakota on Oct. 1.

In announcing the change, the company stated: "Effective Tuesday morning, Oct. 1, 1940, Standard Oil Co. of Indiana will advance all subnormal tankwagon prices to both dealers and consumers in the state of North Dakota on Stanolind (third-grade gasoline) one-half cent per gallon, or to normal if the subnormalcy is less than one-half cent per gallon."

Socony-Vacuum Cuts Tank Car Prices

N. P. N. News Bureau

NEW YORK, Sept. 30.—A 0.2c to 0.4c reduction in its tank car prices for gasoline throughout New York and New England has been announced by Socony-Vacuum Oil Co., Inc. Reduction was effective Sept. 25, and at the same time, tank wagon prices were reduced "in those areas where the market is not already depressed," the Socony announcement said.

Pan American to Purchase Hastings Crude

N. P. N. News Bureau

TULSA, Sept. 30.—Pan American Pipe Line Co. will start purchasing crude in the Hastings and South Houston, Texas fields, Oct. 1 and will post prices in line with those being paid by other purchasers, according to a release here today.

Heretofore, Stanolind Oil Purchasing Co. has purchased crude in these fields for delivery to the Pan American refinery at Texas City, it was said.

Pan American Pipe Line Co. owns and will operate the gathering systems and the trunk pipeline serving these fields and the Gillock field in Galveston County, Texas, the report stated.

Louisiana Standard To Buy Arkansas Crude

SHREVEPORT, Sept. 30.—Standard Oil Co. of Louisiana is entering the Schuler, Ark., field as a purchaser of the Janes Sand Crudes. Standard's price posting, effective immediately begins at 55c for below 21 gravity then increases to 57c for 21 gravity and 2c for each degree of gravity to 95c for 40 and above.

This posting is 10c per bbl. higher than the recently reduced price posted by Root Petroleum Co. for this sour crude.

Complete Text of Complaint Filed in Oil Suit

In the District Court of the United States for the District of Columbia

CIVIL ACTION NO. .....

United States of America, plaintiff

v.

American Petroleum Institute, et al.

COMPLAINT

The United States of America, by Edward M. Curran, its attorney for the District of Columbia, acting under the direction of the Attorney General, brings this complaint against the above-named defendants and upon information and belief alleges:

I

DESCRIPTION OF DEFENDANTS

1. The defendant American Petroleum Institute, hereinafter referred to as the "Institute", is a membership corporation organized under the laws of the District of Columbia and maintains an office at Room 930 in the Munsey Building, 1329 E Street, N.W., Washington, D. C.

2. The following defendants, hereinafter referred to as the "Majors", are duly organized and existing under the laws of the respective States and have their principal places of business as indicated in the following table:

Name of Corporation	Abbreviated Name	State of Incorporation	Location of Principal Place of Business
The Atlantic Refining Co.	Atlantic	Pa.	Philadelphia, Pa.
Barnsdall Oil Co.	Barnsdall	Del.	Tulsa, Okla.
Cities Service Co.	Cities Service	Del.	New York, N. Y.
Consolidated Oil Corp.	Consolidated	N. Y.	New York, N. Y.
Continental Oil Co.	Continental	Del.	Ponca City, Okla.
Gulf Oil Corp.	Gulf	Pa.	Pittsburgh, Pa.
Mid-Continent Petroleum Corp.	Mid-Continent	Del.	Tulsa, Okla.
The Ohio Oil Co.	Ohio	Ohio	Findlay, Ohio
Phillips Petroleum Co.	Phillips	Del.	Bartlesville, Okla.
The Pure Oil Company	Pure	Ohio	Chicago, Ill.
Shell Union Oil Corp.	Shell	Del.	New York, N. Y.
Skelly Oil Co.	Skelly	Del.	Tulsa, Okla.
Socony-Vacuum Oil Co. Inc.	Socony	N. Y.	New York, N. Y.
Standard Oil Co. of California	Socal	Del.	San Francisco, Cal.
Standard Oil Co. (Ind.)	Stanolind	Ind.	Chicago, Ill.
Standard Oil Co. (Ky)	Soky	Ky.	Louisville, Ky.
Standard Oil Co. (N. J.)	Esso	N. J.	New York, N. Y.
Standard Oil Co. (Ohio)	Sohio	Ohio	Cleveland, O.
Sun Oil Co.	Sun	N. J.	Philadelphia, Pa.
The Texas Corp.	Texas	Del.	New York, N. Y.
Tide Water Associated Oil Co.	Tide Water	Del.	New York, N. Y.
Union Oil Co. of Cal.	Union	Cal.	Los Angeles, Cal.

3. The following defendants, subsidiaries and affiliates of defendant majors, hereinafter referred to as "Secondaries," are duly organized and existing under the laws of the respective States, have their principal places of business at and are affiliated with the defendant majors as indicated in the following table:

Name of Corporation	Affiliation	State of Incorporation	Location of Principal Place of Business
Abbott Gasoline Co.	Pure	Mich.	Ann Arbor, Mich.
Ajax Pipe Line Corp.	Sohio-Pure-Esso	Del.	Tulsa, Okla.
Alco Royalty Corp.	Phillips	Del.	Bartlesville, Okla.
Allen Petroleum Corp.	Pure	Del.	Seaford, Del.
American Bitumuls Co.	Socal	Del.	San Francisco, Cal.
American Mineral Spirits Co.	Pure	Ill.	Chicago, Ill.
The American Oil Co.	Pure	Ohio	Hattiesburg, Miss.
The American Oil Co. (Md.)	Stanolind	Md.	Baltimore, Md.
Arkana Transit Corp.	Ohio-Cities Service	Del.	Shreveport, La.
Arkansas Fuel Oil Co.	Cities Service	W. Va.	Shreveport, La.
Arkansas Natural Gas Corp.	Cities Service	Del.	Shreveport, La.
Arkansas Pipeline Corp.	Cities Service	Del.	Shreveport, La.
Asiatic Petroleum Corp.	Shell	Del.	New York, N. Y.
Associated Oil Co. of Wyo.	Tide Water	Wyo.	San Francisco, Cal.
Atlantic Oil Shipping Co.	Atlantic	Del.	Philadelphia, Pa.
Atlantic Petroleum Purchasing Corp.	Atlantic	Md.	Philadelphia, Pa.
Atlantic Pipe Line Co.	Atlantic	Md.	Philadelphia, Pa.
Atlas Gas & Oil Co., Inc.	Mid-Continent	Minn.	St. Paul, Minn.
Atlas Supply Co.	Stanolind-Sohio-Esso	Del.	Newark, N. J.
Baker Oil Co.	Mid-Continent	Ark.	North Little Rock, Ark.
Bareco Oil Co.	Barnsdall	Del.	Tulsa, Okla.
Barnsdall Pipe Line Co.	Barnsdall	Del.	Tulsa, Okla.
Barnsdall Products Corp.	Barnsdall	Del.	Tulsa, Okla.
Baron-Huot Oil Co.	Mid-Continent	Ill.	Kankakee, Ill.
Bartron Petroleum Corp.	Pure	N. J.	Tennent, N. J.
Beacon Sun Co.	Sun-Esso	Del.	Philadelphia, Pa.
Bell General Transit Corp.	Pure	Tex.	Tulsa, Okla.
Berea Engineering Co.	Sohio	Ohio	Cleveland, O.
Big Lake Oil Co.	Continental	Del.	Pittsburgh, Pa.
The Boston-Wyoming Oil Co.	Continental	Ariz.	Ponca City, Okla.
Bradford Transit Co.	Tide Water	Pa.	Bradford, Pa.
The Buck Creek Oil Co.	Continental	Wyo.	Ponca City, Okla.
Buffalo Pipe Line Corp.	Atlantic	N. Y.	Big Flats, N. Y.
California Coast Oil Co.	Tide Water-Union	Cal.	Los Angeles, Cal.
The California Co.	Socal	Cal.	San Francisco, Cal.
California Petroleum Corp. (Utah)	Texas	Utah	Calpet, Wyo.
California Pipe Line Co.	Socal	Nev.	San Francisco, Cal.
California Standard Oil Co., Ltd.	Socal	Cal.	San Francisco, Cal.
Cape Fear Terminal Co.	Pure-Esso	N. C.	Wilmington, N. C.
The Carter Oil Co.	Esso	W. Va.	Tulsa, Okla.
Central Oil Co., Inc.	Pure	Ga.	Augusta, Ga.
Central States Pipe Line Co.	Texas	Ill.	Tulsa, Okla.
Certified Auto Service, Inc.	Texas	Nev.	San Francisco, Cal.
Chappell Oil Co.	Continental	Wyo.	Ponca City, Okla.
Cherokee Oil Co., Inc.	Pure	Tenn.	Knoxville, Tenn.
Cities Service Oil Co. (Del.)	Cities Service	Del.	Bartlesville, Okla.
Cities Service Oil Co. (Pa.)	Cities Service	Pa.	New York, N. Y.
Claremont Oil Co.	Union	Cal.	Los Angeles, Cal.
Colonial Beacon Oil Co.	Esso	Mass.	Boston, Mass.
Colonial Oil Co.	Pure	Ga.	Savannah, Ga.
Colonial Oil Company, Inc.	Pure	Va.	Norfolk, Va.
Col-Tex Refining Co.	Socal	Del.	Okla. City, Okla.
Commercial Oil Co.	Sohio	Ohio	Cleveland, Ohio
Commonwealth Petroleum Holding Co.	Consolidated	Del.	New York, N. Y.
Conewango Refining Co.	Consolidated	Pa.	Warren, Pa.
Conoco Oil Co. (Minn.)	Continental	Minn.	Ponca City, Okla.
The Consolidated Gasoline Co.	Pure	Ohio	Toledo, O.
Consolidated Oil Co. of Houston, Tex.	Cities Service	Tex.	Houston, Tex.
Consolidated Pipe Line Co.	Consolidated	Del.	Independence, Kan.
Continental Mexican Petroleum Co.	Socony	Del.	Los Angeles, Cal.
Continental Oil Co. (Tex.)	Continental	Tex.	Houston, Tex.
Continental Pipe Line Co.	Continental	Del.	Ponca City, Okla.
Continental Steamship Co.	Continental	Del.	Baltimore, Md.
Cosden Pipe Line Co.	Mid-Continent	Okla.	Tulsa, Okla.
Crew-Levick Co.	Cities Service	Del.	New York, N. Y.
Crowley Oil and Mineral Co.	Stanolind	La.	Tulsa, Okla.
Crude Oil Marketing and Trading Co.	Continental	Tex.	San Antonio, Tex.
Crude Oil Pipe Line Co.	Continental	Tex.	San Antonio, Tex.
Crude Oil Terminal Co.	Continental	Tex.	Corpus Christi, Tex.
Davis Gasoline Co.	Pure	Mich.	Toledo, O.
Defiance Hi-Speed Oil Co.	Pure	Ohio	Defiance, O.
Delaware Consolidated Oil Co.	Pure	Del.	Tulsa, Okla.
Detroit Southern Pipe Line Co.	Pure-Gulf-Sun	Mich.	Chicago, Ill.
Diamond Oil Co.	Mid-Continent	Wis.	Milwaukee, Wis.
Diamond Osborn Oil Co.	Mid-Continent	Ill.	Rockford, Ill.
Downtown Auto Parking Co.	Pure	Ill.	Chicago, Ill.
Doyle Gasoline & Oil Co., Inc.	Gulf	N. Y.	Rochester, N. Y.
Eagleroc Oil Co.	Sohio	Ohio	Youngstown, O.
Eastern Terminal Corp.	Shell	Mass.	New York, N. Y.
East Texas Refining Co.	Skelly	Tex.	Dallas, Tex.
Empire Gas & Fuel Co.	Cities Service	Del.	Jersey City, N. J.
Empire Pipeline Co.	Cities Service	Del.	Bartlesville, Okla.
Enalpac Oil and Gas Co.	Ohio	Wyo.	Casper, Wyo.
Esso, Inc.	Esso	Del.	New York, N. Y.
Ethyl Gasoline Corp.	Esso	Del.	New York, N. Y.
Exchange Oil Co.	Consolidated	Me.	Tulsa, Okla.
Finance Co. of the Carolinas, Inc.	Pure	N. C.	Charlotte, N. C.
Fleet-Wing Corp.	Sohio	Ohio	Cleveland, O.
Fordsville Gathering Line, Inc.	Sohio	Ind.	Owensboro, Ky.
Foreign Tankship Corp.	Socal	Panama	San Francisco, Cal.
Fort Collins Producing Corp.	Continental	Colo.	Ponca City, Okla.
Frank Harris Floyd, Inc.	Socony	Mich.	Detroit, Mich.
Franklin Railway Oil Corp.	Socony	Del.	New York, N. Y.
Frontenac Pipe Line Co.	Texas	Tex.	Tyler, Tex.
Fuel Oil Corp.	Sohio-Pure	Ohio	Detroit, Mich.
General Petroleum Co., Inc.	Socony	N. Y.	New York, N. Y.
General Petroleum Corp. of California	Socony	Del.	Los Angeles, Cal.
General Petroleum Corp. of Nevada	Socony	Nev.	Los Angeles, Cal.
General Pipeline Co. of Cal.	Socony	Cal.	Los Angeles, Cal.
General Terminal Co.	Socony	Cal.	Los Angeles, Cal.
Genessee-Diamond Oil Co.	Mid-Continent	Mich.	Flint, Mich.
Gilbert & Barker Mfg. Co.	Esso	Mass.	Springfield, Mass.
Gilco, Inc.	Socony	Cal.	Long Beach, Cal.
Gilmore Development Co.	Socony	Cal.	Los Angeles, Cal.
Gilmore Oil Co.	Socony	Cal.	Los Angeles, Cal.
Gilmore-Snyder Co.	Socony	Cal.	Los Angeles, Cal.
Goodyear-Wende Oil Corp.	Texas	N. Y.	Buffalo, N. Y.
Great Lakes Pipe Line Co.	Texas-Phillips-Mid-Continent Consolidated-Pure-Skelly-Continental-Cities Service	Del.	Kansas City, Mo.
Great Lakes Transport Corp.	Pure-Sohio	Del.	Detroit, Mich.
Great Southern Oil Co.	Tide Water	Kan.	Kansas City, Kan.
Group No. 1 Oil Corp.	Continental	Del.	Fort Worth, Tex.
Group No. 2 Oil Corp.	Continental	Del.	Fort Worth, Tex.
Gulf Refining Co.	Gulf	Del.	Pittsburgh, Pa.
Gulf Research & Development Co.	Gulf	Del.	Pittsburgh, Pa.
Hardrock Oil Co.	Stanolind	Mont.	Great Falls, Mont.

Complete Text of Complaint and List of Defendants in Oil Suit

Name of Corporation	Affiliation	State of Incorporation	Location of Principal Place of Business
Hickok Oil Corp.	Pure	Ohio	Toledo, O.
Hickok Oil Corp. (Mich.)	Pure	Mich.	Toledo, O.
Hickok Pipe Line Co.	Pure	Ohio	Toledo, O.
The Hickok Producing and Development Co.	Pure	Ohio	Toledo, O.
Highland Oil Corp.	Pure	Mich.	Detroit, Mich.
Hi-Speed Oil Corp.	Pure	Mich.	Inlay City, Mich.
Hi-Speed Tire & Accessory Co.	Pure	Ohio	Toledo, O.
Hope Construction and Refining Co.	Esso	Del.	Pittsburgh, Pa.
Hope Natural Gas Co.	Esso	W. Va.	Pittsburgh, Pa.
Hope Producing Co.	Esso	Del.	Monroe, La.
Hudson Oil Co.	Stanolind	Wyo.	Tulsa, Okla.
Hughes Oil Co.	Consolidated	Del.	Chicago, Ill.
Humble Oil & Refining Co.	Esso	Tex.	Houston, Tex.
Humble Pipe Line Co.	Esso	Tex.	Houston, Tex.
Huntington Beach Co.	Socal	Cal.	San Francisco, Cal.
Hy-grade Petroleum Corp.	Gulf	N. Y.	New York, N. Y.
The Illinois Pipe Line Co.	Ohio	Ohio	Findlay, O.
Independent Natural Gas Co.	Phillips	Del.	Bartlesville, Okla.
Independent Oil Co. Inc of Pa.	Socony	Del.	Altoona, Pa.
Indian Refining Co.	Texas	Me.	Lawrenceville, Ind.
Indian Territory Illuminating Oil Co.	Cities Service	N. J.	Bartlesville, Okla.
International Pipe Line Co.	Texas	Mont.	Sunburst, Mont.
International Refining Co.	Texas	Mont.	Sunburst, Mont.
Jacox Oil Corp.	Pure	Mich.	Belleville, Mich.
Johnson Oil Co.	Pure	Mich.	Bay City, Mich
Kalamazoo-Diamond Oil Co.	Mid-Continent	Mich.	Kalamazoo, Mich.
Kaw Pipe Line Co.	Texas-Cities Service- Phillips	Del.	Tulsa, Okla.
Kay & Kiowa Oil Co.	Mid-Continent	Okla.	Tulsa, Okla.
Kesbec, Inc.	Esso	N. Y.	New York, N. Y.
Kettleman & Inglewood Corp.	Socal	Nev.	San Francisco, Cal.
Kettleman North Dome Assn.	Socony-Continental-Texas-Tide Water-Socal-Union	Cal.	Los Angeles, Cal.
Kettleman Oil Corporation, Ltd.	Socal	Del.	San Francisco
Keystone Pipe Line Company	Atlantic	Pa.	Philadelphia
K. & Q. Service Stations, Inc.	Socony	N. Y.	New York City
Lake View Oil Company	Union	Cal.	Los Angeles
Lansing Oil Company	Mid-Continent	Mich.	Lansing, Mich.
Laramie Oil Company	Stanolind	Wyo.	Laramie, Wyo.
Latonia Refining Corporation	Sohio	Ohio	Cleveland
Lima Hi-Speed Company	Pure	Ohio	Lima, Ohio
Lisbon Gasoline Company, Inc.	Cities Service	Ark.	Shreveport, La.
Lord Baltimore Filling Stations, Inc.	Stanolind	Md.	New York City
Los Angeles Midway Pipe Line Company	Consolidated-Cities Service	Cal.	Los Angeles
Los Angeles Oil Company	Union	Cal.	Los Angeles
Magnolia Petroleum Company	Socony	Tex.	Dallas, Tex.
Magnolia Pipe Line Company	Socony	Tex.	Dallas, Tex.
Magnolia Pipe Line Company of Illinois	Socony	Ill.	Dallas, Tex.
Main Oil Company	Pure	Mich.	Holland, Mich.
Martin & Schwartz, Inc.	Sun-Socony	N. Y.	Buffalo, N. Y.
Merrico Royalties Company	Continental	Wyo.	Ponca City, Okla.
Merritt Oil Corporation	Continental	Me.	Ponca City, Okla.
Mexican Petroleum Corporation	Stanolind	Me.	New York City
Mexican Petroleum Corporation of Georgia	Stanolind	Ga.	New York City
Michigan-Toledo Pipe Line Company	Sohio	Del.	Mt. Pleasant, Mich.
Middlesex Pipe Line Company	Sun	N. J.	Philadelphia
Mid-South Oil Company	Pure	Ohio	Memphis, Tenn.
Midwest Oil Company	Stanolind	Ariz.	Denver, Colo.
Mission Corporation	Tide Water-Skelly	Nev.	Reno, Nev.
Moreland Oil Corporation of Delaware	Socony	Del.	Adrian, Mich.
Motor Tankship Corporation	Sun	Del.	Philadelphia
Mountain Producers Corporation	Stanolind	Del.	Denver, Colo.
Mountain State Gas Company	Pure	W. Va.	Chicago
Mount Clemens Oil Company	Pure	Mich.	Mt. Clemens, Mich.
Murphy Oil Company	Socal	Cal.	San Francisco
Murphy-Miles Oil Company	Stanolind	Ill.	Chicago
New Mexico Pipe Line Company	Continental	N. Mex.	Ponca City, Okla
North West Oil Company	Stanolind	Ill.	Chicago
The Ohio Independent Oil Company	Sohio	Ohio	Springfield, Ohio
The Ohio Producing and Refining Company	Esso	Del.	Cleveland
Ohio River Pipe Line Company	Sohio	Del.	Ashland, Ky.
Oklahoma Pipe Line Company	Esso	Okla.	Tulsa, Okla.
Olympic Oil Corporation	Pure	Ohio	Cleveland
Orange State Oil Company	Cities Service	Fla.	Miami, Fla.
Owensboro-Ashland Company	Sohio	Ky.	Owensboro, Ky.
Pacific Western Oil Corporation	Tide Water-Skelly	Del.	Jersey City, N. J.
Pan American Petroleum Company	Cities Service-Consolidated	Cal.	Los Angeles
Pan American Petroleum Corporation	Stanolind	Del.	New York City
Pan American Petroleum & Transport Company	Stanolind	Del.	New York City
Pan American Pipe Line Company	Stanolind	Del.	New York City
Pan American Production Company	Stanolind	Del.	New York City
Pan American Refining Corporation	Stanolind	Del.	New York City
Pan American Southern Corporation	Stanolind	Del.	New York City
Pantheon Oil Company	Tide Water	Cal.	San Francisco
Paramount-Pingree Oil Company	Continental	Utah	Salt Lake City
Paso-Tex Pipe Line Company	Socal	Del.	San Francisco
Peconic Oil Corporation	Pure	N. Y.	Riverhead, N. Y.
Peninsular Oil Company	Sohio	Mich.	Detroit
Peninsular Oil & Refining Company	Esso	Fla.	Tampa, Fla.
Pennsylvania Oil Marketers, Inc.	Tide Water	Del.	New York City
Penola, Inc.	Esso	Del.	Pittsburgh
Petroleum Advisors, Inc.	Cities Service	N. J.	New York City
Petroleum Corporation of America	Consolidated Continental Gulf Esso Mid-Continent Ohio Cities Service Socony Socal Stanolind Texas Tide Water	Del.	Jersey City, N. J.
Petroleum Heat & Power Company	Stanolind	Del.	New York City
Petroleum Terminals, Inc.	Pure	Mich.	Detroit
Petroleum Transit Corporation	Socony Pure Shell Cities Service Stanolind Atlantic Sohio Esso	Ohio	Detroit
Phillips Pipe Line Company	Phillips	Del.	Bartlesville, Okla.
Pioneer Midway Oil Company, Consolidated	Tide Water	Cal.	San Francisco
Pittsburgh Oil & Gas Company	Barnsdall	Del.	Pittsburgh
The Pocahontas Oil Corporation	Pure	Ohio	Cleveland
Pontiac Oil & Gas Company	Pure	Mich.	Pontiac, Mich.
Producers Oil Corporation	Pure	Mich.	Owosso, Mich.
Pure Oil Company of the Carolinas, Inc.	Pure	N. C.	Charlotte, N. C.
Pure Oil Company of Tennessee	Pure	Tenn.	Atlanta, Ga.
Pure Oil Distributing Company	Pure	Del.	Beaumont, Tex.
Pure Oil Pipe Line Company (Pennsylvania)	Pure	Penn.	Chicago
Pure Oil Products Company	Pure	Ohio	Chicago
Pure Transportation Company	Pure	Ohio	Chicago
Puritan Petroleum Corporation	Pure	Penn.	Shenandoah, Pa.
Puritan Stations, Inc.	Pure	Mich.	Detroit
Reagan County Purchasing Company, Inc.	Continental	Del.	Ft. Worth, Tex.
Red "C" Oil Company	Atlantic	Md.	Baltimore
Red Indian Oil Company	Sohio	Mich.	Detroit
Refiners Oil Corporation	Soky	Ky.	Louisville, Ky.
Repollo Oil Company	Consolidated	Wyo.	Tulsa, Okla.
Reserve Gas Company	Esso	W. Va.	Pittsburgh
Reservoir Hill Gasoline Company	Cities Service-Consolidated	Cal.	Los Angeles
Reward Oil Company	Tide Water	Cal.	San Francisco
Richardson Lubricating Company	Continental	Ill.	Quincy, Ill.
Richfield Oil Company	Consolidated-Cities Service	Cal.	Los Angeles
Richfield Oil Corporation	Consolidated-Cities Service	Del.	Los Angeles
Richfield Oil Corporation of New York	Consolidated	Del.	New York City
Richfield Realty Corporation	Cities Service-Consolidated	Cal.	Los Angeles
Ridge Oil Corporation	Sohio	Ohio	Madison, Ohio
Rio Grande Oil Company, Inc.	Cities Service-Consolidated	Nev.	Los Angeles
Rock River Petroleum Company	Ohio	Del.	Findlay, Ohio
Rocky Mountain Pipe Line Company	Continental	Del.	Denver, Colo.
Sabine Transportation Company, Inc.	Pure	Del.	Port Arthur, Tex.
Saxet Heights Pipe Line Company	Continental	Tex.	San Antonio, Tex.
Seaboard Oil Company of Delaware	Texas-Tide Water	Del.	New York City
Seaboard Oil Company, Inc.	Pure	Ohio	Jacksonville, Fla.
Seaside Oil Company	Tide Water	Cal.	Santa Barbara, Cal.
Shaw Bros. Oil Company	Pure	Fla.	Miami, Fla.
Shell American Petroleum Company	Shell	Del.	Kokomo, Ind.
Shell Oil Company, Inc.	Shell	Va.	New York City
Shell Pipe Line Corporation	Shell	Md.	St. Louis
Sherrill Oil Company	Pure	Ohio	Pensacola, Fla.
Sherrill Terminal Company	Pure	Fla.	Pensacola, Fla.
Sherwood Brothers, Incorporated	Consolidated	Md.	Baltimore
Signal Hill Gasoline Company	Cities Service-Consolidated	Cal.	Los Angeles
Simrall Corporation	Sohio	Del.	Mt. Pleasant, Mich.
Sinclair Navigation Company	Consolidated	Del.	New York City
Sinclair Prairie Oil Company	Consolidated	Me.	Tulsa, Okla.
Sinclair Prairie Oil Company of Louisiana, Inc.	Consolidated	La.	Tulsa, Okla.

Name of Corporation	Affiliation	State of Incorporation	Location of Principal Place of Business
Sinclair Prairie Oil Marketing Company	Consolidated	Del.	Independence, Kan.
Sinclair Refining Company	Consolidated	Me.	New York City
Sinclair Wyoming Oil Company	Consolidated	Del.	Tulsa, Okla.
Skelco Products Company	Skelly	Mo.	Kansas City, Mo.
Skelly Refining Company, Inc.	Skelly	Tex.	Bay City, Tex.
Sobol Bros. Service Stations, Inc.	Socony	N. Y.	New York City
Socony-Vacuum Oil Corporation	Socony	Del.	New York City
Sohio Corporation	Sohio	Del.	Cleveland
Sohio Pipe Line Company	Sohio	Del.	Cleveland
Sohio Producing Company	Sohio	Ohio	Cleveland
Sommers Home Oil Company	Continental	Colo.	Denver, Colo.
Southeastern Pipe Line Company	Gulf-Pure	Del.	Atlanta, Ga.
Southern Phillips Corporation	Phillips	Del.	Corpus Christi, Tex.
South Penn Oil Company	Tide Water	Pa.	Pittsburgh
Southwestern Wharf Company	Socony	Cal.	Los Angeles
Spanish Peak Oil Company	Esso	Okla.	Ardmore, Okla.
Stanavo Specifications Board, Inc.	Socal	Del.	San Francisco
Standard Gas Company	Socal	Idaho	San Francisco
Standard Oil Company of Louisiana	Esso	La.	Baton Rouge, La.
Standard Oil Company of Nebraska	Stanolind	Neb.	Omaha, Neb.
Standard Oil Company of New Jersey	Esso	Del.	New York City
Standard Oil Company of New York	Socony	Del.	New York City
Standard Oil Company of Pennsylvania	Esso	Del.	Philadelphia
Standard Oil Company of Texas	Socal	Del.	San Francisco
Standard Oil Company (Washington)	Socal	Wash.	San Francisco
Standard Oil Export Corporation	Esso	Del.	New York City
The Standard Shale Products Company	Continental	Colo.	Ponca City, Okla.
Standard Stations, Inc.	Socal	Del.	San Francisco
Standish Pipe Line Company	Phillips	Del.	Bartlesville, Okla.
Stanolind Oil & Gas Company	Stanolind	Del.	Tulsa, Okla.
Stanolind Oil Purchasing Company	Stanolind	Del.	Tulsa, Okla.
Stanolind Pipe Line Company	Stanolind	Maine	Tulsa, Okla.
Sterling Oil & Development Company	Tide Water	Cal.	San Francisco
Summerfield Oil Company	Pure	Mich.	Flint, Mich.
The Sun Oil Line Company	Sun	Ohio	Philadelphia
Sun Oil Line Company of Michigan	Sun	Mich.	Philadelphia
Sun Pipe Line Company	Sun	Tex.	Beaumont, Tex.
Sun Pipe Line, Inc.	Sun	N. Y.	Philadelphia
Susquehanna Pipe Line Company	Sun	Pa.	Philadelphia
Supreme Pacific Oil Co., Inc.	Socony	Pa.	Scranton, Pa.
Sweetwater Oil Company	Stanolind	Wyo.	Rock Springs, Wyo.
Sylvestre Oil Company	Esso	N. Y.	Mt. Vernon, N. Y.
Sylvestre Oil Terminal Company, Inc.	Esso	Del.	Mt. Vernon, N. Y.
Sylvestre Utilities Company, Inc.	Esso	Del.	Mt. Vernon, N. Y.
Tabb's-Bay Oil Company	Gulf	Ariz.	Houston, Tex.
The Texas Company (California)	Texas	Cal.	Los Angeles
The Texas Company (Delaware)	Texas	Del.	New York City
The Texas-Empire Pipe Line Company	Texas-Cities Service	Del.	Tulsa, Okla.
The Texas-Empire Pipe Line Company of Texas	Texas Tide Water Cities Service	Del.	Tulsa, Okla.
Texas-New Mexico Pipe Line Company	Texas Tide Water Cities Service Consolidated	Del.	Houston, Tex.
The Texas Pipe Line Company	Texas	Tex.	Houston, Tex.
The Texas Pipe Line Company of Oklahoma	Texas	Okla.	Tulsa, Okla.
Texas Production Company of Nebraska	Texas	Neb.	New York City
Texon Oil & Land Company	Continental	Del.	Ft. Worth, Tex.
Texon Oil & Land Company of Texas	Continental	Tex.	Ft. Worth, Tex.
Theisen-Clemens Company	Mid-Continent	Mich.	St. Joseph, Mich.
Theisen-Clemens Investing Company	Mid-Continent	Mich.	St. Joseph, Mich.
The Tide-Water Pipe Company, Limited	Tide Water	Pa.	Bradford, Pa.
Tidal Pipe Line Company	Tide Water	Okla.	Tulsa, Okla.
Toledo Northern Pipe Line Company	Pure Gulf	Ohio	Chicago
Transit & Storage Company	Esso	Del.	Port Huron, Mich.
Treasure State Pipe Line	Ohio	Mont.	Sunburst, Mont.
Tri-Lakes Corporation	Sohio	Del.	Mt. Pleasant, Mich.
Tuscarora Oil Company, Ltd.	Esso	Pa.	Harrisburg, Pa.
Union Oil Company of Nevada	Union	Nev.	Los Angeles
Union Steamship Company	Union	N. J.	Los Angeles
The United Oil Company	Cities Service-Consolidated	Cal.	Los Angeles
United States Pipe Line Company	Pure	Pa.	Chicago
Utah Oil Refining Company	Stanolind	Utah	Salt Lake City
Vacuum Oil Company (Delaware)	Socony	Del.	New York City
Valley Pipe Line Company	Texas	Cal.	Los Angeles
Wabash Pipe Line Company	Pure	Ill.	Chicago
Wadhams Oil Company	Socony	Wis.	Milwaukee, Wis.
Waggoner Service Stations, Inc.	Socony	Ill.	Chicago
Warner-Quinlan Company of Texas	Cities Service	Tex.	Ft. Worth, Tex.
Washington Refining Company	Shell	Wash.	San Francisco
West Coast Oil Company	Tide Water	Cal.	San Francisco
Westcott Oil Company	Continental	Idaho	Boise, Idaho
Western Gulf Oil Company	Gulf	Del.	Pittsburgh, Pa.
West-Harden Oil Company, Inc.	Pure	Va.	Covington, Va.
White Eagle Pipe Line Company, Inc.	Socony	Kan.	Kansas City, Mo.
White Star Northern Oil Company	Socony	Mich.	Newberry, Mich.
Wilson Oil Corporation	Pure	Mich.	Detroit
Woco-Pep Company of Tuscaloosa	Pure	Ala.	Tuscaloosa, Ala.
Wofford Oil Company (Alabama)	Pure	Ala.	Birmingham, Ala.
Wofford Oil Company of Georgia	Pure	Ga.	Atlanta, Ga.
Yount-Lee Pipe Line Company	Stanolind	Tex.	Tulsa, Okla.

4. The following individuals, not made defendants herein, connected with the corporate defendants as indicated in the following table, have been active in the management of the Institute and have been actively engaged in the management, direction and control of the affairs and policies of the respective defendant majors and secondaries, particularly those affairs, activities and policies hereinafter described in this complaint:

Name of Individual	Affiliation
K. S. Adams	Director—Institute President & Director—Phillips Vice President & Director—Alco Royalty Corp. Director—Southern Phillips Corp.
C. E. Arnott	Director—Institute Vice Pres. & Director—Socony
Amos Ball	Member of Marketing Committee—Institute Director and Vice Pres.—Stanolind
Charles J. Barkdull	Director—Institute Ex. Vice Pres. & Dir.—Stanolind Director—Stanolind Oil Purchas. Co. Director—Stanolind Pipe Line Co. Director—Pan American Petroleum & Transport Co. Director—Pan American Producing Co. Director—Pan American Refining Corp. Director—Mexican Petroleum Corp. of Georgia
S. Belither	Director—Institute Director—Shell Director, Vice Chairman of Board & Executive Vice Pres.—Shell Oil Co., Inc. Director & Pres.—Washington Refining Co.
W. H. Berg	Member of Ex. Committee—Institute Director—Institute Director & President—Socal Director & Pres.—The California Co. (Calif.)
R. A. Broomfield	Director—Institute Director & Ex. Vice Pres.—Barnsdall
Edwy Rolfe Brown	Director—Institute Director & Chairman of Board—Magnolia Petro. Co. Director & Vice President—Socony Director—Socony-Vacuum Oil Corp. Director & Chairman of Board—Magnolia Pipe Line Co.
John S. Brown	Member of Ex. Com.—Institute Director—Institute Director, Chairman of Ex. Com. & Pres.—Socony
Axtell J. Byles	Pres.—Institute Member of Ex. Committee—Institute
J. W. Carnes	Chairman of Board of Directors—Richfield Oil Corporation of New York Vice President & Director—Sinclair Refining Co. Member of Marketing Committee—Institute
Sheldon Clark	Director & Vice Pres.—Consolidated Director & Vice Pres.—Sinclair Refining Co.
Robert H. Colly	Member of Executive Committee—Institute Director—Institute President & Director—Atlantic Vice President—Atlantic Pipe Line Co. Director & Vice Pres.—Atlantic Oil Shipping Co. Vice Pres. & Dir.—Buffalo Pipe Line Corp. Vice Pres. & Dir.—Keystone Pipe Line Co.
H. D. Collier	Director—Institute President & Director—South Penn Oil Co.
Ralph K. Davies	Director—Institute Vice Pres.—The California Company (Calif.) Vice Pres. & Dir.—Socal Member of Marketing Committee—Institute
Henry M. Dawes	Member of Ex. Committee—Institute Director—Institute Pres. & Director—Pure

Name of Individual	Affiliation
T. A. Dines	Director, Institute Chairman of Board & Pres.—Utah Oil Refin. Co. Director—Midwest Oil Co.
Henry W. Dodge	Vice Pres.—Texas Director—Goodyear-Wende Oil Corp. Director & Vice Pres.—Indian Refining Co. Vice Pres. & Gen. Sales Manager—The Texas Company (Del.) Member of Marketing Committee—Institute
O. D. Donnell	Treas. & Dir.—Institute Member of Ex. Com.—Institute Director & Pres.—Ohio Member of Production Com.—Institute
J. Frank Drake	Director—Institute Pres. & Dir.—Gulf Pres. & Dir.—Gulf Refining Co. Dir. & Chairman of Board—Western Gulf Oil Co. Dir. & Chairman of Board—Gulf Research & Development Co.
W. S. Farish	Director—Institute Member of Ex. Com.—Institute Pres. & Dir.—Esso Dir.—Ethyl Gasoline Corp.
W. H. Ferguson	Director—Institute Director & Ex. Vice Pres.—Continental Director & Pres.—Rocky Mountain Pipe Line Co. Dir. & Vice Pres.—The Boston-Wyoming Oil Co. Dir. & Vice Pres.—Chappell Oil Co. Vice Pres.—Continental Pipe Line Co. Director & Vice Pres.—Merritt Oil Corp. Director & Vice Pres.—The Buck Creek Oil Co. Director & Vice Pres.—Fort Collins Producing Corp. Director & Pres.—Morrico Royalties Co. Director & Pres.—New Mexico Pipe Line Co. Director & Vice Pres.—The Standard Shale Products Co. Member of Marketing Committee—Institute
Jacob France	Director—Institute Director & Pres.—Mid Continent Director—Great Lakes Pipe Line Co. Director—Theisen-Clemens Co. Pres.—Coades Pipe Line Co.
Alexander Fraser	Director—Institute Director & Pres.—Shell Oil Co., Inc. Director—Shell Director & Pres.—Shell American Petroleum Co.
Harry D. Frueauff	Director—Institute Director—Empire Gas & Fuel Co. Director & Vice Pres.—Cities Service Oil Co. (Del.) Director & Vice Pres.—Cities Service Oil Co. (Pa.) Director—Indian Territory Illuminating Oil Co. Member of Marketing Committee—Institute Manager, Oil Departments—Cities Service
Herbert R. Gallagher	Director—Institute Pres. & Dir.—Consolidated Dir.—Richfield Oil Corp. Dir. & Chairman of Board—Sinclair Refining Co. Dir., Pres. & Chairman of Board—Commonwealth Petroleum Holding Co.
George J. Hanks	Dir. & Pres.—Bradford Transit Co. Dir. & Vice Pres.—Tide Water Dir. & Vice Pres.—Tidal Pipe Line Co.
D. W. Harris	Vice Pres. & Dir.—Arkana Transit Corp. Pres. & Dir.—Arkansas Pipeline Corp. Vice Pres., Dir. & Gen. Manager—Arkansas Fuel Oil Co. Pres. & Dir.—Orange State Oil Co. Vice Pres. & Dir.—Lisbon Gasoline Co., Inc.
William V. Hartman	Director—Institute Director & Vice Pres.—Gulf Director & Vice Pres.—Gulf Refining Co. Director & Vice Pres.—Gulf Research & Development Co. Director—Detroit Southern Pipe Line Co. Member of Marketing Committee—Institute
Edw. J. Henry	Director—Institute Director & Pres.—Atlantic Pipe Line Co. Director & Vice Pres.—Atlantic Director & Pres.—Atlantic Petroleum Purchasing Co. Member of Refining Committee—Institute
George A. Hill, Jr.	Director—Institute Vice Pres. for Production—Institute Member of Executive Committee—Institute Chairman of Production Committee—Institute Chairman of Committee on Well Spacing—Institute
W. T. Holliday	Director—Institute Pres. & Director—Sohio Pres. & Dir.—Latonia Refg. Corp. Pres. & Director—Tri-Lakes Corp. Pres. & Dir.—Fleet-Wing Corp. President and Director—Fordsville Gathering Line, Inc. President & Director—Sohio Producing Co. Pres. & Dir.—Sohio Pipe Line Co. Pres. & Dir.—Sohio Corp.
Wm. F. Humphrey	Director—Institute Member of Executive Committee—Institute Pres. and Director—Tide Water Director and Pres.—Patheon Oil Co. Director & Pres.—Pioneer Midway Oil Co., Consolidated Director and President—Reward Oil Co. Director & President—West Coast Oil Co. Director and President—Associated Oil Co. of Wyoming Director—Sterling Oil & Development Co.
Allan Jackson	Director and Vice President—Stanolind Member of Marketing Committee—Institute
Charles S. Jones	Director—Institute President and Director—Richfield Oil Corp. President & Director—Reservoir Hill Gasoline Co. President & Director—Gio Grange Oil Co., Inc.
W. Alton Jones	Member of Executive Committee—Institute Director and President—Cities Service Director and Vice President—Arkansas Pipeline Corp. Director—Arkansas Fuel Oil Co. Vice President & Director—Empire Gas and Fuel Co. Director & Chairman of Finance Committee—Richfield Oil Corp. Director and Vice President—Indian Territory Illuminating Oil Co. Director—Institute
Harry T. Klein	Director—Institute Director—Texas Production Co. of Nebraska Director—Goodyear-Wende Oil Corp. Director, Vice President and Member of Executive Committee—Texas Director & Vice President—The Texas Co. (Del.) Director—Indian Refining Co. Director—Seaboard Oil Co. of Delaware
F. A. Leovy	Director—Institute Member of Executive Committee—Institute Director & Vice Chairman of the Board—Gulf Director and Chairman of the Board—Gulf Refining Co. Director & Pres.—Western Gulf Oil Co. Director and President—Gulf Research and Development Co.
M. E. Lombardi	Director and Vice President—Socal Vice Pres.—The California Co. (Calif.) Pres.—California Pipe Line Co. Member of Production Committee—Institute
John M. Lovejoy	Director—Institute Member of Production Committee—Institute President—Seaboard Oil Co. of Delaware
George MacDonald	Director—Cities Service Director—Consolidated Director—Petroleum Corp. of America Director—Richfield Oil Corp
A. M. Maxwell	Director and Vice Pres.—Sohio Director—Fleet-Wing Corp. Director—Atlas Supply Co. Director & Vice Pres.—Latonia Refining Co. Director—Simrall Corp. Director & Vice Pres.—Sohio Producing Co. Director & Vice Pres.—Sohio Corp. Director & Vice Pres.—Sohio Pipe Line Co. Director & Vice Pres.—Tri-Lakes Corp.
Wm. A. McAfee	President and Director—Ajax Pipe Line Corp. Director—Fuel Oil Corp. Director—Sohio Director—Latonia Refining Corp. Director—Fleet-Wing Corp. Director—Simrall Corp. Director—Michigan-Toledo Pipe Line Co. Director—Sohio Producing Co.
R. W. McDowell	Director—Institute Vice President in Charge of Sales—Mid-Continent President and Director—Genessee-Diamond Oil Co. Vice President and Director—Baron-Huet Oil Co. Member of Marketing Committee—Institute
Dan Moran	Director—Institute Director and Pres.—Continental Pres. & Dir.—Great Lakes Pipe Line Co. President and Director—The Boston-Wyoming Oil Co. President and Director — Continental Oil Co. (Texas) President and Director—Continental Pipe Line Co. President and Director—Merritt Oil Corp. President and Director—The Buck Creek Oil Co. President and Director—Fort Collins Producing Co.
Harry Moreland	Director—Institute Vice President and General Manager—Great Lakes Pipe Line Co.
J. Howard Pew	Director—Institute Vice President for Refining—Institute Member of Executive Committee—Institute President and Director—Sun Member of Production Committee—Institute Chairman of Refining Committee—Institute Director—Beacon Sun Company President and Director—Motor Tankship Corp.
Frank Phillips	Director—Institute Member of Executive Committee—Institute Chairman of Board & Director—Phillips President and Director—Alco Royalty Corp.
E. B. Reeser	Director—Institute Pres. and Director—Barnsdall Pres. and Director—Barnsdall Pipe Line Co. Pres. and Director—Pittsburgh Oil & Gas Co. Member of Marketing Committee—Institute
Torkild Rieber	Director—Institute Chairman of Board, Director and Member of Executive Committee—Texas Chairman of Board and Director—The Texas Co. (Del.) Director—Indian Refining Co. Director—Seaboard Oil Co. of Delaware Director—Goodyear-Wende Oil Corp.
W. S. S. Rodgers	Director—Institute Member of Executive Committee—Institute Chairman of Public Relations Committee—Institute President, Director & Member of Executive Committee—Texas Director and President—The Texas Co. (Del.) Director—The Texas Co. (Cal.) Director—Indian Refining Co. Director—Goodyear-Wende Oil Corp. Director—Great Lakes Pipe Line Co.

Name of Individual	Affiliation
L. P. St. Clair	Director—Institute Director, Former President and Former Chairman of Board—Union Former Director and President—California Coast Oil Co. Former Director—Claremont Oil Co.
E. H. Salrin	Director—Institute Vice President & Director—Tide Water Vice President and Director—Tidal Pipe Line Co. President and Director—Great Southern Oil Co. Member of Production Committee—Institute
Edward G. Seubert	Director—Institute Member of Executive Committee—Institute President and Director—Stanolind Director and Vice President—Mexican Petroleum Corporation of Georgia Director and Vice President—Pan American Petroleum and Transport Co. Director and Vice President—Pan American Refining Corporation Director and Vice President—Pan American Production Co. Director—Pan American Southern Corp. Director & Vice President—Stanolind Oil Purchasing Co. Director & Vice President—Stanolind Pipe Line Co. Director—Pan American Petroleum Corp.
E. W. Sinclair	Director—Institute Director, Chairman of Finance Committee and Executive Vice President—Consolidated President and Director—Sinclair Refining Co. Director and Treasurer — Petroleum Corp. of America Director—Commonwealth Petroleum Holding Co. Director—Great Lakes Pipe Line Co.
Harry F. Sinclair	Director—Institute Member of Executive Committee—Institute Director & Chairman of Executive Committee—Consolidated Chairman of the Board of Directors—Richfield Oil Corp. Director—Petroleum Corp. of America
Warren A. Sinsheimer	Director—Arkansas Pipeline Corp. Director—Arkansas Fuel Oil Co. Director—Empire Gas and Fuel Co. Vice President and Director—Empire Pipeline Co. Director—Cities Service Oil Co. Director—Indian Territory Illuminating Oil Co.
W. G. Skelly	Director—Institute Member of Executive Committee—Institute President and Director—Skelly Director and President—Mission Corp. Director and President—Pacific Western Oil Corp. Director—Great Lakes Pipe Line Co. President and Director—Skelco Products Co. President and Director—East Texas Refining Co.
Wm. E. Smith	Director—Institute President and Director—Soky President and Director—Refiners Oil Corp.
W. L. Stewart, Jr.	Director—Institute Vice Pres. and Dir.—Union Vice Pres. and Dir.—Union Steamship Co. Director—Claremont Oil Co. Vice Pres. & Director—Lake View Oil Co. Director—Los Angeles Oil Co. Member of Refining Committee—Institute
Herbert R. Straight	Director—Institute Director—Empire Gas & Fuel Co. President, Director & General Manager—Cities Service Oil Co. Pres., Gen. Mgr., and Dir.—Empire Pipeline Co. Director—Richfield Oil Corp. Director—Texas Empire Pipe Line Co. (Del.) Director—Cities Service Director—Great Lakes Pipe Line Co.
Sidney A. Swensrud	Vice President—Sohio Director—Fleet-Wing Corp. Director—Commercial Oil Co. Director—Engleroc Oil Co. Director—Ohio Independent Oil Co. Director—Ridge Oil Corp. Director and Assistant Secretary — Fordsville Gathering Line, Inc. Director and Assistant Secretary—Simrall Corp. Director and Assistant Secretary—Michigan-Toledo Pipe Line Co. Assistant Secretary—Sohio Corp. Director—Berea Engineering Co. Vice President and Assistant Secretary—Sohio Pipe Line Company Director and Vice President—Ohio River Pipe Line Co.
Reese H. Taylor	Director—Institute Director and President—Union
Walter C. Teagle	Director—Institute Chairman of Board—Esso Director—Ethyl Gasoline Corp.
Temple W. Tutwiler	President and Director—Arkansas Fuel Oil Co. Vice President and Director—Arkansas Pipeline Corp. Director and President—Cities Service Oil Co., (Pa.) Vice President and Director—Empire Gas and Fuel Co. Vice President and Director—Indian Territory Illuminating Oil Co. Director—Richfield Oil Corp. Director—Cities Service Director—Orange State Oil Co.
R. G. A. van der Woude	Director—Institute Member of Executive Committee—Institute President and Director—Shell Director and Chairman of Board—Shell Oil Co. Inc. Director—Asiatic Petroleum Corp.
W. G. Violette	Vice President & Director—Soky Vice President and Director—Refiners Oil Corp. Member of Marketing Committee—Institute
Cornelius B. Watson	Director & Vice President—Pure Director—Great Lakes Pipe Line Co. Director—Rickok Oil Corp. President and Director—Detroit Southern Pipe Line Co. President and Director — Pure Transportation Company Member of Refining Committee—Institute Member of Marketing Committee—Institute
Earle W. Webb	Director—Institute Director & Pres.—Ethyl Gasoline Corp.
A. L. Weil	Director and President—General Pipe Line Co. (Cal.) Director and President—General Petroleum Corp. of California President—General Petroleum Corp. of Nevada

Jurisdiction and Nature of Charges Alleged

II

JURISDICTION AND VENUE

5. This complaint is filed and these proceedings are instituted Under Section 4 of the Act of Congress of July 2, 1890, c. 647, 26 Stat. 209, as amended, entitled "An Act to Protect Trade and Commerce Against Unlawful Restraints and Monopolies," said Act being commonly known as the "Sherman Antitrust Act," and under Section 15 of the Act of Congress of October 15, 1914, c. 323, 38 Stat. 730, as amended, said Act being commonly known as the "Clayton Act," against the above named defendants in order to prevent and restrain violations by them of Sections 1, 2 and 3 of the Sherman Act and Sections 2 and 3 of the Clayton Act.

6. The alleged unlawful acts and violations hereinafter described, including the unlawful monopoly, attempts to monopolize, combinations and conspiracies to monopolize, and contracts, combinations and conspiracies to restrain trade and commerce in petroleum and its products among the several States of the United States, with foreign nations and within the District of Columbia, have been and are conceived, carried out, and made effective in part within the District of Columbia, and many of the unlawful acts done in pursuance thereof have been performed by the defendants or some of them and their respective respresentatives within said District. The following defendants transact business or may be found within the District of Columbia: American Petroleum Institute, Phillips Petroleum Company; The Texas Company (Delaware); Lord Baltimore Filling Stations, Inc.; Sun Oil Company; Gulf Oil Corporation; Standard Oil Company of New Jersey; Sherwood Brothers, Incorporated; Petroleum Heat & Power Company; Shell Oil Company, Inc.; The American Oil Company (Md.); The Atlantic Refining Company; Cities Service Oil Company (Pa.); Continental Oil Company; Sinclair Refining Company; Gulf Refining Company; Richfield Oil Corporation of New York; and Tide Water Associated Oil Company. The interstate trade and commerce involved in the petroleum industry is carried on in part within the District of Columbia.

III

Interstate Commerce Involved

7. Crude oil moves in interstate commerce from centers in producing states to refineries located in other states. Such interstate movement is carried on mainly through the trunk pipelines operating in 21 states and transporting approximately one billion bbls. of crude oil per year. The trunk pipelines also carry crude oil from producing states to water terminals from which it is moved by tankers to refineries located in other states and to foreign nations. Crude oil also moves in interstate commerce between points of production and refineries by means of barges, lake tankers railroad tank cars, and trucks. The principal petroleum products move in interstate and foreign commerce from the refineries to distribution and consuming points throughout the United States and to foreign nations by means of gasoline pipelines, railroad tank cars, trucks and trailers, tankers, barges, and tank wagons. There is a continuous flow of petroleum products in interstate commerce from the refinery to the tank of the consumer. Gasoline pipelines, tankers, barges, tank cars, bulk plants, tank wagons, and service stations are merely facilities in this flow. The trans-

fer from one facility to the other is merely a convenience in handling petroleum products and does not interrupt the continuous interstate flow which begins at the refinery and ends at the consumer's container. Practically all the defendant majors and producing secondaries are engaged in the production and purchase of crude oil in the producing states and move and transport crude oil in interstate commerce through defendant controlled pipelines from states where produced or purchased to refineries located in other states. Defendant majors and marketing secondaries engage in the movement of the principal petroleum products in interstate commerce from refineries to consumers' containers throughout the United States.

Four Branches of Industry, Crude Reserves, Described

IV

Description of the Industry

8. The petroleum industry is divided into four branches—production, transportation, refining and marketing. Crude oil is produced from subsurface deposits known as crude oil reserves. While the known reserves cannot be inventoried with any degree of certainty, the total recoverable reserves estimated by geologists as of January 1, 1940, amounted to over eighteen billion bbls. Fear of the exhaustion of these reserves has prompted the adoption of conservation programs, rationing the production of crude oil by the various fields, pools, and wells, which are administered by designated agencies of the states and federal government.

9. Crude oil is produced from more than 375,000 oil wells producing approximately 1,250,000,000 bbls. per year. The producing wells are located in 23 states, but 84% of the total production is contributed by wells located in the states of Texas, Oklahoma, California, Illinois and Louisiana.

10. Crude oil moves usually through gathering pipelines which take the crude oil at the well and transport it directly to a refinery located in the field or to a trunk pipeline which transports the crude oil either to the refinery or to a water terminal from which it is in turn shipped to the refinery by tanker or barge. There are 52,000 miles of gathering lines of which 75% are common carriers by statute. While there may be several gathering systems in one field, each one reaching hundreds of wells, no well is connected with more than one system. A very small quantity of crude oil moves overland by truck and railroad but the cost of these forms of transportation is greater than the cost of transportation through pipelines.

11. There are 60,000 miles of crude oil trunk line 87% of which are common carriers subject to the jurisdiction of the Interstate Commerce Commission.

12. Where feasible the cheapest method of transporting crude oil is by tanker or barge and large quantities of crude oil are shipped by this method.

13. There are 547 refineries located in 35 states. These refineries are located, for the most part, at places to which adequate supplies of crude oil may be economically transported.

14. The refineries themselves are of two general types: those utilizing simple distillation processes, and those utilizing the more recently developed patented "cracking" processes which are not only more economical but have made it possible over the last twenty years to increase the average recovery of gasoline from crude oil from 26 to 45%.

15. The total daily capacity of these refineries is 4,625,000 bbls. Refineries located in Texas, California, Pennsylvania, Illinois, Indiana, Oklahoma, New Jersey, and Louisiana have over 81% of the capacity. The total daily runs to stills is approximately 3,400,000 bbls., and the principal products produced are gasoline, fuel oils, kerosine, and lubricants.

16. Petroleum products are transported from refineries to the consuming areas usually by pipelines, tankers and tank cars when the refinery is located near the oil fields and away from the consuming area, and by tank car, tank truck and trailer, and tank wagon when the refinery is near the area of consumption. The gasoline pipeline, which is the most economical method of transporting petroleum products overland, has been developed almost wholly since 1930 and today there are about 8,000 miles of such lines connecting refineries and tanker terminals with consuming areas. Approximately 66% of gasoline pipelines are common carriers subject to the jurisdiction of the Interstate Commerce Commission.

17. Upon reaching the consuming areas the petroleum products are stored in 27,000 local terminals and bulk plants for distribution to 200,000 service stations, to approximately the same number of other establishments selling petroleum products, and to commercial consumers.

18. Thousands of individuals and hundreds of corporations engage in the petroleum industry which represents an investment of approximately fifteen billion dollars and is exceeded in size only by agriculture, the railroad industry, and the combined divisions of the utility fields. This investment is distributed among the four principal divisions as follows: production—43%, transportation—17%, refining—27%, and marketing—13%. In the producing branch of the industry, thousands of small landowners and others own or operate oil wells or collect royalties on oil produced. There are approximately 100 companies engaged in transportation of petroleum products as a sole function. Approximately 200 companies operate the refineries. The marketing of petroleum products is carried on by approximately 25 large companies and their subsidiaries, 8000 individual and incorporated brokers, jobbers and distributors, 200,000 service station operators, and 200,000 merchants who sell petroleum products in conjunction with other merchandise.

19. The key characteristic of the industry today is complete integration, the culmination of a 25-year trend. Today the 22 fully integrated oil companies, called majors, control the 344 secondary companies which are engaged in one or more of the functions of production, transportation, refining and marketing. With their secondary companies the majors form 22 completely integrated units, each unit thus operating in all four branches of the industry. Joint ownership of some of the secondary companies is part of the pattern of the industry. These companies have total assets on a consolidated basis of approximately nine billion dollars. Their individual assets are as follows:

Name of Company	Total assets
Atlantic Refining Co.	$203,400,377
Barnsdall Oil Co.	25,762,319
Cities Service Co.	1,068,578,765
Consolidated Oil Corp.	357,848,818
Continental Oil Co.	127,661,986
Gulf Oil Corp.	523,292,917
Mid-Continent Petroleum Corp.	65,103,571
The Ohio Oil Co.	133,748,393
Phillips Petroleum Co.	223,280,318
The Pure Oil Co.	178,567,387
Shell Union Oil Corp.	401,048,417
Skelly Oil Co.	62,048,509
Socony-Vacuum Oil Co., Incorporated	929,066,796
Standard Oil Co. of California	628,618,202
Standard Oil Co. (Indiana)	723,079,697
Standard Oil Co. (Kentucky)	42,697,777
Standard Oil Co. (New Jersey)	2,034,989,485
The Standard Oil Co. (Ohio)	76,072,531
Sun Oil Co.	146,431,484
The Texas Corp.	661,067,032
Tide Water Associated Oil Co.	204,467,844
Union Oil Co. of California	187,066,399

22 Major Companies 'Dominate' Industry in All Branches

20. These 22 integrated companies occupy a position of great dominance in the industry. They own or control over sixty-five per cent of the known crude oil reserves, thirty-two per cent of the oil wells (and the oil wells of the majors produce fifty per cent of the total production), ninety-two per cent of the stocks of crude oil, eighty per cent of the crude oil storage capacity, seventy-six per cent of the crude-oil refining capacity, eighty-eight per cent of the cracking capacity; produce eighty-five per cent of the gasoline refined; possess ninety per cent of the stocks of finished gasoline, ninety-two per cent of the stocks of fuel oil, ninety-one per cent of the stocks of kerosine, ninety-three per cent of the stocks of lubricants, and eighty-eight per cent of the stocks of gas oil and distillate fuel oils; and control seventy-five per cent of the bulk plants, and seventy-five per cent of the service stations. In the transportation branch of the industry the majors own or control fifty-seven per cent of the crude oil gathering lines, eighty-five per cent of the crude oil trunk pipelines, eighty-seven per cent of the deadweight tonnage of oil tankers and ninety-six per cent of the mileage of gasoline pipelines.

21. The position of the majors in this industry is indicated in the following chart:

Phases and Functions	Number of majors	% of ownership or control
Investment	22	60.0
Crude oil reserves	21	68.0
Number of producing oil wells	21	32.4
Crude oil production	21	50.0
Crude oil gathering pipe line mileage	21	57.5
Ratio of purchases of crude oil to total U. S. production	20	56.8
Ratio of crude oil transported in gathering lines to total U. S. production	20**	62.5
Crude oil trunk pipe line mileage	20	85.6
Barrel-miles of crude oil transported in trunk lines*	15	96.5
Investment in crude oil pipe lines*	15	89.3
Income of crude oil pipe lines*	15	95.7
Stocks of crude oil	21	92.5

Crude oil storage capacity	21	79.1
Imports of crude oil	6	90.6
Exports of crude oil	14	66.7
Crude oil refining capacity	21	76.1
Crude oil runs to stills	21	82.7
Cracking capacity	21	87.6
Production of gasoline	21	84.6
Stocks of finished gasoline	20**	90.0
Exports of gasoline	14	95.0
Ratio of domestic sales of gasoline to total U. S. consumption	22	87.1
Gasoline pipe line mileage	17**	96.3
Barrel-miles of gasoline by pipe lines	15	96.5
Investment in gasoline pipe lines*	12	100.0
Income of gasoline pipe lines*	12	100.0
Deadweight tonnage of oil tankers	15	87.2
Stocks of lubricants	19**	93.0
Stocks of kerosine	19**	91.2
Stocks of gas oil and distillate fuel oils	19**	88.1
Stocks of residual fuel oils	20**	92.0
Number of domestic bulk plants	20**	74.7
Number of service stations	22	75.0

*Coverage of the Interstate Commerce Commission only.

**Data for all defendant majors not available. The dominance of the defendant majors has been steadily increasing while the position of all others in the industry, commonly known as "independent" producers, refiners, marketers, and service station operators, has been steadily decreasing.

22. In addition to the control by the majors over pipeline transportation hereinbefore described their control over transportation facilities is implemented by long term charter parties which they induce the owners of uncontrolled tankers and barges to enter into by paying rates in excess of those economically feasible for the independent producers and refiners. Further, the majors reduce transportation costs for themselves by the use of so-called exchange accounts. Under this system one refiner will deliver gasoline or other products to the local storage facilities of another refinery in return for a similar accommodation by the latter refiner in some other area. Such exchange arrangements are rarely made with independent refiners.

23. The control by the majors over the marketing facilities for petroleum products is gained through their outright ownership of bulk plants and contracts with the owners of bulk plants requiring the owners to deal only in the products of the particular defendant, and through ownership, leases, exclusive dealing contracts, and offering inducements to other operators to enter into exclusive dealing arrangements in the case of service stations. Some of the service stations the majors own or lease and operate themselves; other stations they own or lease and sublease to operators under the "Iowa Plan." Under this plan which has been put into effect mainly in the states east of the Rocky Mountains, the majors lease or sublease service stations to operators who are given possession under uniform leases adopted by the majors which contain a short term cancellation provision. These leases do not provide for the exclusive handling of the lessor's petroleum products, but the majors have the power, through threatening to cancel the lease by exercising the short term cancellation clause, to force the operator to handle the lessor's petroleum products exclusively and to sell them at the prices dictated by the lessor; the lessor also cancels leases when the operator fails to maintain or increase the predetermined gasoline gallonage which forms the basis for calculating rent, or when the operator refuses to purchase supplies of automotive equipment from the lessor or the persons designated by him. In addition, the majors have the power to force operators to maintain or increase the predetermined gasoline gallonage by dictating the reduction of sales prices without making a corresponding reduction in the price at which the operator purchases the gasoline.

24. Non-lessee service station operators are induced to enter into exclusive dealing contracts requiring the operators to buy all of their gasoline or other petroleum products from the particular major company by granting them a special discount which is not granted to those who buy from more than one supplier, by operating a nation-wide credit service in which the supplier guarantees the credit of those purchasing from the operators; by guaranteeing margins; by loaning money and equipment; and by threatening ruinous competition.

Nature of Offenses Described in Detail

V.

OFFENSES CHARGED

25. Each of the defendants and the defendants collectively have violated and are now violating Sections 1, 2 and 3 of the Sherman Act, by unlawfully attempting to monopolize, monopolizing and contracting, combining and conspiring to regulate, control, dominate, monopolize, and restrain trade and commerce among the several states of the United States, with foreign nations, and within the District of Columbia and have violated and are now violating Sections 2 and 3 of the Clayton Act in the manner and by the means hereinafter described:

The Institute

26. The defendants have unlawfully combined to create, maintain, and utilize the Institute and its national, regional, state and local committee as an instrumentality for promoting, supervising and enforcing policies, programs, practices, and activities of the defendants designed to restrict the production of crude oil and petroleum products, to establish and maintain sales prices for petroleum and its products, to manipulate prices in order to restrict or eliminate competition among the defendants, to deprive others of a fair opportunity to compete freely and unrestrictedly with the defendants, and to enable the defendants to dominate, control and monopolize the petroleum industry in all its phases. The managing officials of the Institute and the members of the various committees are the officers and other representatives of the majors and secondaries made defendant herein.

Controlling and Restricting the Production of Crude Oil and Manufacture of Petroleum Products

27. Defendants are jointly and individually acquiring an increasingly dominant control over the known crude oil reserves of the United States through purchase and lease and on option.

28. The defendants have combined and conspired to restrict the production of crude oil and the manufacture of petroleum products. The defendants report weekly to the Institute the amounts and locations of all stocks of petroleum products owned or held by each of them on the last day of each preceding week and cause the Institute to summarize such detailed information and disseminate it, together with the Institute's suggestions of the amounts of crude oil which should be produced and the Institute's suggestions of the amounts of petroleum products which should be manufactured and maintained in storage, to defendants and the public. The suggested amounts of crude oil to be produced are less than the amounts which would normally be produced even in states operating under conservation programs, and the suggested amounts of petroleum products to be manufactured and maintained in storage are less than the amounts which would normally be manufactured and maintained in storage. The defendants adopt the suggestions of the Institute, thereby curtailing the amounts of crude oil produced and the amount of petroleum products manufactured. The defendants, the Institute, and its production and refining committees and sub-committees also promote individual and joint agreements, among defendants, and independent producers and refiners, and associations of producers and refiners, to restrict production of crude oil and to restrict the manufacture of petroleum products to the amounts suggested by the Institute.

29. Defendants have combined and agreed to follow the practice of receiving, in their crude oil gathering lines, from independent producers who have only one market because there exists no other practical means of transportation, less crude oil than the amounts which they would normally produce and, in states operating under conservation programs, less than the pro-rated allowables fixed by state proration authorities, thereby reducing the amount of crude oil produced by the independent producers.

The Pricing of Crude Oil

30. Defendants have combined and conspired to fix and maintain uniform non-competitive prices to be paid by them for the crude oil purchases from independent producers. In order to maintain uniform prices, the defendants agree that one of them will post, in each crude oil field or pool, the agreed upon prices. The defendants also agree that each of them will post and follow the prices posted by the designated defendant in each of the pools and fields in which they purchase crude oil. In fields where independent refiners compete with defendants in purchasing crude oil, defendants fix higher prices for crude oil, without reference to its specific gravity, than they fix in fields where defendants control production and gathering lines. Since the net cost of crude oil to defendants is lower than the prices posted in these fields where the defendants fix the higher prices, due to low cost production and purchases elsewhere, the independent refiners, who are forced to rely solely upon purchases in those fields, cannot obtain crude oil supplies on a competitive cost basis with defendants and as a result are driven out of business.

31. The defendants also have combined and conspired to fix and maintain uniform non-competitive prices to be charged by them in sales of crude oil to in-

dependent refiners. Through their activities, defendants control practically all of the supply of crude oil available for refining, and independent refiners, most of whom do not have independent sources of crude oil, are compelled to purchase all or a large part of their requirements from defendants. Defendants follow the practice of selling crude oil to independent refiners at fixed prices which are arrived at by adding to the fixed price for crude oil the agreed upon published tariff rates for pipeline transportation and arbitrarily adopted rates for gathering and storing of such oil, thereby placing independent refiners at a substantial price disadvantage over the defendants in procuring crude oil supplies, and, in addition, independent refiners directly pay tribute to the defendants on purchases of crude oil to the extent of the excessive amounts charged them for gathering, transportation and storage.

Pipelines Are 'Rebating' To Shippers, is Charge

Transportation

32. Defendants, controlling pipeline gathering systems leading from producing wells to the defendants' crude oil trunk pipelines, are jointly and individually following the practice of compelling independent producers, who have no other practical means of transportation to competitive markets, to sell crude oil to the defendants at the well rather than permitting them to use such lines on a common carrier basis and reach those markets in which they might sell their production. Defendants thereby gain control of the crude oil produced by such independent producers.

33. Defendants are concertedly causing those defendants, who individually and jointly own and operate interstate crude oil trunk pipelines and interstate gasoline pipelines, to adopt and file with the Interstate Commerce Commission, tariffs, rules and regulations, covering the interstate transportation of crude oil, gasoline and other petroleum products, which require that shippers tender to such carriers unreasonably large quantities, commonly called "minimum tenders", of crude oil and petroleum products, to maintain and charge uniform non-competitive, onerous and oppressive rates for the transportation of crude oil, and uniform non-competitive, onerous and oppressive rates at rail freight rate levels irrespective of the cost of service for the transportation of petroleum products, and to fail to provide to shippers the ordinary common carrier terminal facilities at both ends of and along the pipelines. These tariff requirements are put into effect for the purpose and with the effect of reserving such pipelines as private carriers for the defendants who are large shippers advantageously located at existing terminals along the pipelines, despite the fact that these crude oil trunk pipelines have been common carriers by statute for many years, and these gasoline pipelines have been common carriers by statute since installation. The result is that independent producers and refiners are precluded from using the crude oil trunk pipelines on a common carrier basis in violation of Section 1 of the Act to Regulate Commerce, and from locating their refineries at advantageous points along such pipelines or at their terminals in large consuming areas, to restrain the interstate transportation of crude oil, and to obtain for defendants a monopoly of crude oil. The result is also to preclude independent refiners and distributors from using gasoline pipelines on a common carrier basis, in violation of Section 1 of the Act to Regulate Commerce, and from marketing their products in the consuming areas served by these pipelines, and to restrain the interstate transportation of petroleum products.

34. The defendants have combined and conspired to charge excessive rates for the use of crude oil and gasoline pipelines and to receive back as refunds and rebates on the rates charged to themselves a substantial part of the revenue from pipeline operations in violation of Sections 2 and 6 of the Act to Regulate Commerce, as amended, and Section 1 of the Elkins Act, as amended. These rebates result in crude oil and petroleum products being transported for defendants at less rates than those named in the tariffs published and filed by the pipelines and are used by defendant owners to subsidize operations in other branches of the industry thereby enabling them to enjoy an unfair competitive advantage over their independent competitors who are unable to use such pipelines under the terms, conditions and regulations imposed by the defendants.

35. Defendants have combined and conspired to cause railroads to establish and maintain rates favorable to them and unfavorable to the independent refiner.

36. Defendants jointly and individually exert influence upon and connive with officials, traffic managers and other employes of railroad companies, which haul petroleum products in interstate commerce throughout the United States, to cause these railroad companies to establish and maintain high rail freight rates on long hauls of petroleum products from areas where independent refiners are located to consuming areas where defendants dominate, control and monopolize the distribution and sale of petroleum products. These rates prevent independent refiners from competing with defendants in the distribution and sale of petroleum products and maintain the transportation factor used as part of the price fixing program hereinafter described.

37. Defendants jointly and individually exert influence upon and connive with officials, traffic managers and other employes of railroad companies, which haul petroleum products in interstate commerce throughout the United States, to cause these railroad companies to establish and maintain agreed upon low rail freight rates on transportation of petroleum products in interstate commerce from the refineries, pipeline terminals and water terminals of defendants to points of distribution located in the consuming areas where defendants dominate, control and monopolize the distribution and sale of petroleum products. This enables defendants to obtain the advantages of low rail freight rates which discriminate against independent refiners who are attempting to market petroleum products in interstate commerce in competition with defendants.

38. In carrying out the program for the establishment and maintenance of rail freight rates as hereinabove described, defendants are jointly and individually resorting to the practice of threatening to build and utilize more gasoline pipelines, to increase the use of motor trucks, to increase the use of tanker and barge facilities and to refuse to use rail transportation facilities unless the railroads establish and maintain rates agreeable to defendants.

39. Defendants are jointly and individually acquiring and maintaining a dominating control over tankers, barges, tank cars, and other facilities for the interstate transportation of crude oil and petroleum products, by purchase, long term contracts and leases. Defendants have combined and conspired to maintain and establish and to induce others to maintain excessive rates for the use of such facilities, thereby preventing their use by independent competitors.

Nearly All Bulk Plants in U. S. 'Controlled' by Majors

Marketing Policies and Price Differentials

40. Defendants have combined and conspired to distribute their petroleum products at wholesale only through facilities operated by persons, firms, or corporations whose buying, selling and operating policies defendants are able to control. They have obtained such control over practically all of the thousands of bulk plants, located throughout the United States, through which petroleum products pass in interstate commerce from refineries to service stations and consumers' containers. Control of these bulk plants is obtained through exclusive dealing contracts with jobbers and distributors and by forcing, through the use of unfair practices, independent refiners, jobbers and distributors to sell or lease them to defendants. These practices include threats of ruinous competition, promises of guaranteed margins, making of unwarranted and excessive loans of money on bulk plants, and the offering of free equipment and other valuable property and services to the service station customers of such refiners, jobbers and distributors. Defendants use these bulk plants for the exclusive distribution of their petroleum products, either by direct operation or through distributors under exclusive contracts or exclusive commission agents to whom the plants are leased. By the means, methods and practices described defendants are denying the use of existing bulk plant facilities to independent refiners and jobbers and are monopolizing the essential facilities for the distribution of petroleum products and petroleum products themselves.

41. Defendants are combining and conspiring to distribute their petroleum products only through service stations operated by persons, firms and corporations whose buying, selling, and operating policies defendants are able to control. Such control is acquired through ownership, leases, subleases, exclusive dealer contracts, granting of differentials in price to exclu-

sive operator-purchasers while denying them to competing non-exclusive operator-purchasers of petroleum products of like grade, quality and quantity, in violation of Section 3 of the Robinson-Patman Act, granting nation-wide credit card service to exclusive operators, offering inducements such as loans of money and guaranteed margins, loaning of equipment, and threats of ruinous competition, for the purpose of monopolizing service station outlets. The granting of differentials in price to exclusive station operators is also a discrimination in violation of Section 2, as amended, of the Clayton Act.

42. Defendants marketing gasoline throughout the United States, and particularly throughout the 43 states east of the Rocky Mountains and in the District of Columbia, have unlawfully combined and conspired to put into effect and maintain the so-called "Iowa Plan." Under this plan defendants lease service stations, which they control by ownership or lease, to lessee-operators and compel those operators to handle exclusively the particular lessor's brand of petroleum products. These lessee-operators are given possession of the service stations under uniform leases, adopted by defendants, which specify the term of occupancy, the rental and other lease provisions, including a short term cancellation clause. These leases do not provide for the exclusive handling of the defendants' petroleum products, but defendants are requiring each lessee-operator to handle the petroleum products of the lessor exclusively and compel him to refuse to distribute, display, or handle any petroleum products of a competitor. Defendants compel the lessee-operator to maintain or increase the predetermined gasoline gallonage which forms the basis for calculating the rental of the service station. Defendants fix and dictate the prices at which lessee-operators shall sell defendants petroleum products. To effectuate the plan, defendants threaten to and do cancel the leases on service stations and dispossess lessee-operators by exercising the short term cancellation clause of the lease when the lessee-operator refuses to handle lessor's petroleum products exclusively, or upon lessee-operator's refusal to sell the petroleum products at the prices dictated by defendant lessor. The defendants' operations under the Iowa Plan have eliminated competition among defendants and deprived independent refiners, jobbers and distributors of outlets for the marketing of their petroleum products in competition with defendants.

43. Defendants have combined and conspired to adopt uniform types of contracts for the sale of petroleum products in interstate commerce to jobbers, distributors, commission agents, nonlessee service station operators and commercial consumers. Each of these contracts contains non-competitive, oppressive and onerous terms and requires that the purchaser shall buy all of his requirements of petroleum products from the particular defendant with whom the contract is executed. Each major and secondary oil company defendant marketing petroleum products forces all their purchasers to execute and abide by the terms of the uniform contract applicable to them. The exclusive dealing provisions of these uniform contracts are also in violation of Section 3 of the Clayton Act.

44. Defendants have combined and conspired to sell petroleum products to operators and lessees of service stations under arrangements requiring them to handle exclusively the petroleum products of one of the defendants. This is accomplished by sales contracts which provide, and sales on oral condition, agreement and understanding, that such purchasers shall not deal in any petroleum products of a competitor or competitors of the particular defendant. The exclusive dealing provisions of the contracts for sale of petroleum products in interstate commerce and the sale of petroleum products in interstate commerce made under the oral arrangements are also in violation of Section 3 of the Clayton Act.

45. Defendants are concertedly following the practice of selling complete and full lines of petroleum products through service stations controlled by them and forcing the operators of service stations to handle exclusively their full lines of petroleum products by threatening to invoke the clause of the leases providing for cancellation on short notice, cancellation of the leases, cancellation of supply contracts, and refusing to sell petroleum products on the exclusive price basis to operators who do not handle their full lines.

Fixing of Prices Charged From Well to 'Gas' Pump

Price Fixing

46. Defendants have combined and conspired to adopt a price-fixing program, and defendants concertedly agree upon sales prices for petroleum products, marketing and price policies, and methods and practices for fixing and maintaining prices, for stabilizing price structures, for lowering prices wherever they wish to eliminate independent competitors, and for raising prices wherever the competition of independent competitors has been eliminated. These agreements are reached at frequent meetings held through the United States under the auspices of the defendant Institute, its marketing committee and subcommittees, and apart therefrom, attended by the officers and other representatives of the defendant majors and secondaries, and others unknown to plaintiff, acting for and on behalf of the defendants.

47. As part of the price-fixing program, defendants have agreed to utilize and are utilizing a pricing formula, of which the basic factor is the price for principal petroleum products at either spot markets or other base points arbitrarily selected by defendants for spot markets for which certain trade journals currently publish such quotations. The base prices at the other base points are prices arrived at by adding to the spot market quotations existing freight rates between spot market locations and the other base points. The prices at these base points are adopted irrespective of the cost of such petroleum products at the points from which shipments are actually made. The prices at the base points are added all rail freight rates to final destinations as a factor in the pricing formula, irrespective of the actual point of origin of the product, and the transportation facility actually used. Prices for petroleum products at final destinations are arrived at by adding the margins allowed by defendants to distributors and retailers as another factor in the formula. In selling to jobbers, distributors and other large quantity purchasers of petroleum products for resale, defendants charge all rail freight rates from base points to purchasers' destinations in addition to the base prices, although such petroleum products actually move in interstate commerce from points of origin other than base points and at costs to defendants less than all rail freight rates. By carrying out this scheme, defendants are able to maintain the factors of their price-fixing formula and exact from purchasers and consumers amounts of money in excess of these actually expended by defendants for transportation from actual points of origin to purchasers' destinations.

48. In order to raise, fix, peg and stabilize spot market prices of gasoline and other petroleum products, defendants purchase, at agreed upon artificially high and non-competitive prices, quantities of these commodities from sellers, mainly independent refiners who sell in the spot markets and elsewhere at prices below those fixed by defendants. Defendants cause such sellers to report to the trade journals the high, fixed prices paid by defendants rather than the lower spot market prices at which the sellers sell to purchasers other than the defendants. The reporting of the agreed upon high prices paid by defendants misleads the trade journals and causes them to publish the fixed spot market prices rather than the lower competitive prices at which gasoline and other petroleum products are being sold currently, thereby making effective and maintaining the fixed, high prices agreed upon by defendants. Such purchasing programs have been organized and utilized by defendants in refining areas throughout the United States and purchases have been made through them from sellers located in the states of California, Wyoming, Montana, Texas, Louisiana, Oklahoma, Kansas, Arkansas, Kentucky, Illinois, Michigan, and Pennsylvania. To facilitate the operation of these purchasing activities, defendants have promoted and organized corporations and voluntary membership organizations among independent refiners. Such purchasing activities monopolize available supplies of these petroleum products; prevent these products from moving in interstate commerce to consuming areas for sale in competition with defendants; artificially raise, fix, peg and stabilize the prices of petroleum products in spot markets; increase, fix and maintain tank car prices of gasoline and petroleum products contracted to be sold and sold in interstate commerce; and increase wholesale and retail prices throughout the United States.

49. Defendants concertedly fix and maintain uniform, excessive and exorbitant price differentials between the various grades of gasoline, that is, third, regular, and premium, thereby exacting unreasonably high prices from jobbers, distributors, service station operators and the consuming public.

50. As a further part of the price-fixing program, defendants concertedly cause a selected defendant to post and publish the agreed upon prices for the sale of petroleum products in tank

car, tank wagon, barrel and gallon lots in designated areas of the United States. The following companies have been selected to post prices in the designated areas:

Selected Company	States in Designated Area
Socony-Vacuum Oil Company, Incorporated	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, and New York
The Atlantic Refining Company	Pennsylvania and Delaware
Standard Oil Company of New Jersey	New Jersey, Maryland, Virginia, West Virginia, North Carolina, South Carolina, and the District of Columbia
The Standard Oil Company (Ohio)	Ohio
Standard Oil Company (Kentucky)	Kentucky, Mississippi, Alabama, Georgia, and Florida
Standard Oil Company (Indiana)	Indiana, Illinois, Michigan, Wisconsin, Missouri, Iowa, Minnesota, Kansas, Nebraska, South Dakota, and North Dakota
Standard Oil Company of Louisiana	Louisiana, Arkansas, and Tennessee
Humble Oil & Refining Company	Texas
Continental Oil Company	Oklahoma, New Mexico, Colorado, Utah, Wyoming, Idaho, and Montana
Standard Oil Company of California	California, Washington, Oregon, Nevada, and Arizona

Ethyl Gasoline Corp. Named

Defendants follow the prices so posted by the selected defendant in quoting, posting and publishing prices for petroleum products and in selling and contracting to sell petroleum products in each of such areas.

51. Defendant Ethyl Gasoline Corporation is the sole manufacturer and distributor of tetra-ethyl lead fluid, a patented fluid, which removes the knocking characteristic of gasoline when mixed as a blending agent. Approximately seventy-five per cent of all motor fuel consumed in the United States contains tetra-ethyl lead fluid and all defendant majors, with the exception of Sun Oil Company, use it as a blending agent. Defendants, individually and collectively, agree with defendant Ethyl Gasoline Corporation to use this fluid on the basis of an agreed system of licenses which are granted by the Ethyl Gasoline Corporation in restrictive licensing contracts, which require uniform methods of blending tetra-ethyl lead fluid with gasoline. Defendants and Ethyl Gasoline Corporation also agree that the latter prohibit the blending, use or marketing of tetra-ethyl lead fluid by non-defendants, except with the approval of, and under terms and conditions dictated by and agreeable to defendants. Defendants do not approve applications of independent refiners who sell gasoline at prices below those fixed and maintained by the defendants.

52. Defendants concertedly fix and maintain the prices at which they require their jobbers, distributors and service station operators, purchasing petroleum products in interstate commerce for resale, to sell such products, and the difference between such agreed upon prices and those at which defendants sell their petroleum products are the margins allowed to such resellers. Defendants have adopted uniform margin provisions as part of the uniform contracts used in selling petroleum products to distributors and through commission agents. These margins are progressively narrowing and at times are fixed and maintained at such low levels that jobbers, distributors, commission agents and service station operators are either barely able to meet their costs of operation and distribution or are compelled to sell at a loss. These uniform narrow margins prevent jobbers, distributors, commission agents, and service station operators, who purchase defendants' petroleum products and sell them to resellers and the consuming public, from competing with the defendants and with each other at prices lower than those fixed by defendants.

53. Defendants have agreed to make and are making periodic inspections and surveys of gasoline prices posted and charged by jobbers, distributors and trackside and other service station operators, for the purpose of ascertaining the identity of those who are selling at prices less than those posted and charged by the defendants. The information as obtained is transmitted to the suppliers of the price-cutting sellers who coerce and compel these sellers to sell at the prices fixed by the defendants by threatening to cut off and cutting off their supply of gasoline.

54. Defendants concertedly designate selected defendants in various localities throughout the United States to supply service stations with petroleum products for resale at prices below those fixed and maintained by defendants and below those at which independents sell, thereby eliminating independent competitors from business and "stabilizing" local price situations without lowering fixed and maintained tank wagon prices. Some of these suppliers and service stations are operated under the guise of independent ownership when in truth and in fact they are owned, controlled or operated by designated defendant companies, individually or jointly. These stations are supplied with petroleum products at a loss to defendants.

55. Defendants are eliminating independent trackside service stations, which are enabled to sell below the prices fixed and maintained by the defendants through savings from direct distribution to the consumer, from business by concertedly forcing railroad companies to refuse new leases and cancel old leases for, and raise rentals on, sites on which trackside service stations are located.

56. Defendants sell petroleum products to so-called commercial consumers, such as transportation companies, industrial establishments, public utilities and others using large quantities of gasoline, fuel oils and lubricants, at fixed prices which are lower than those fixed and maintained by them in sales of identical petroleum products, in similar quantities, to jobbers, distributors, service station operators and the consuming public generally. This practice prevents independent refiners, jobbers, distributors, and service station operators from selling to commercial consumers and enables defendants to monopolize this trade and commerce in petroleum products.

57. When requested to bid on public or private contracts for petroleum products, defendants fix the prices to be submitted as bids and select the defendant who is to be the low bidder. By means of this collusive action defendants refrain from bidding against each other except in a perfunctory manner and without good faith, submit agreed upon uniform prices in lieu of competitive bids, prevent independent refiners, jobbers and distributors from successfully competing with defendants and monopolize the sale of petroleum products to large public and private consumers.

Combinations

58. The twenty-two integrated major companies are engaged in the production, refining, transportation, and marketing of petroleum and its products, while a large number of non-integrated or independent companies engage in one or more but not all of these branches of the industry. Each of the integrated companies is a large combination of capital and individuals possessing great economic power, including the power to handicap or even stifle effective competition by the non-integrated companies. Moreover, all of these integrated companies operate in effect as one unit under substantially identical business policies and practices. Through the control of oil reserves, wells, transportation and marketing facilities, the twenty-two companies have been able to restrict the production of independent producers, exclude independents from the use of transportation and marketing facilities and fix the price of petroleum and its products. In an attempt to prevent such restraints, the government has successfully prosecuted numerous actions against the majors. However, such piecemeal prosecutions have not resulted in the restoration of free competition or prevented the recurrence of such arrangements because the power inherent in the combinations continued to exist.

VI.

Purpose and Effect

59. Defendants have adopted and engaged in each of the means, methods, devices, practices and activities aforesaid with the purpose, intent and actual effect of unlawfully restraining, monopolizing, attempting to monopolize, controlling and otherwise unlawfully restricting the aforesaid trade and commerce in petroleum and its products.

60. Defendants, by concerted action, through the Institute, and independently of it, have actively and effectively restricted their own activities and dominated and restricted the activities and business policies of all others engaged in producing, transporting, refining and marketing petroleum and its products, particularly those activities and policies connected with and relating to the production, transportation, marketing and utilization of crude oil, the methods of transporting and marketing petroleum products

and the price structures of crude oil and petroleum products throughout the industry.

61. Defendants by concertedly engaging in the unlawful activities herein described have monopolized the known crude oil reserves; have limited the amounts of crude oil produced by themselves and others for the purpose of reducing the amount available for the manufacture of petroleum products; have obtained control of practically all of the crude oil produced; have maintained the prices paid to independent producers of crude oil at a low level in all fields except in those where defendants maintained high prices to eliminate independent competitors who had to rely upon purchases in those fields; have restrained the interstate transportation of crude oil; have limited the amounts of petroleum products manufactured by themselves and others; have obtained control of a substantial portion of the petroleum products produced by independent refiners; have monopolized the sale of petroleum products; have precluded independents from competing successfully with them by increasing the independents' cost of transporting petroleum products to market while decreasing their own and by obtaining control of virtually all of the facilities of distribution from refinery to consumer and preventing the operators of these facilities from handling products of independents; have restrained the interstate transportation of petroleum products; and have fixed and maintained high and arbitrary prices for the sale of their petroleum products and have driven out of business independents who attempted to sell below such prices.

62. The consumer has been deprived through the operation of the present structure of the oil industry of the natural advantages of geographical position. The present combination has caused high rates to be charged for the use of pipelines from oil wells to independent refineries and for the use of pipelines or railway haulage from independent refineries to markets. On the other hand the combination has caused the railroads to maintain low rates on the transportation of petroleum products from the refineries and terminals of the integrated companies to consuming areas and has received rebates from pipelines. This has contributed to the maintenance of a fixed price through the reduction of competition; it has also denied to consumers the advantages of natural geographic position, and has resulted in the uneconomic and artificial allocation of the costs of transportation so far as the consumer is concerned.

63. The consumer has been deprived through the operation of the present structure of the oil industry of the ability to buy petroleum products from numerous competitors. The setting of a price, high or low, suitable to the integrated companies, the control of transportation, and the exchange of gasoline between the integrated companies, thus eliminating the cost of transportation while deceiving the public, has eliminated most of the competition and products of independent refineries. The control of bulk plants obtained through exclusive dealing contracts and by threats of ruinous competition, promises of guaranteed margins and excessive loans, and the control of distributors including service stations has eliminated most of the products of independent refiners from the market and has also made it impossible for the consumer to buy at the service station products other than those of the controlling integrated company.

64. The consumer has been deprived through the operation of the present structure of the oil industry of the benefits of technological improvements which should be reflected in lower costs to producers and refiners and lower prices to consumers. The maintenance of fixed prices and artificial transportation rates has restricted or eliminated competition which would force the integrated companies to give to the consumer the benefits of lower costs arising from technological improvements. The price to the consumer does not reflect the lower costs and the greater recovery of gasoline through modern refining methods, and the increased value of by-products. Adoption of artificial transportation rates has also withheld from the consumer the benefits of the development of new types of transportation facilities, such as pipelines, trucks, and barges, because of their use in the price formula which does not take into account either the origin of the product or the transportation facility actually used.

65. The operation of the present structure of the oil industry has fostered and preserved an uneconomic, duplicative and wasteful marketing system. The cost of transporting and marketing the refined product under the present system is greater than the cost of production. This uneconomic system has been preserved through the denial of pipelines to independent refiners and through the capture of marketing outlets by the integrated companies. The present marketing system is wasteful in that it operates through service stations which cannot sell more than one line of products because of agreements in sales contracts and the use of the cancellation clauses in the leases of service stations.

66. The power possessed by the integrated companies has deprived a substantial number of citizens of their justly due profit through the operation of the so-called "Iowa Plan." This plan, previously described, places the burden of competition in the sale of gasoline on the service station operator, who, in order to preserve his lease, is forced to forego the margin allowed for his profit. The advantages that the consumer obtains through lower prices are thus placed at the expense of the service station operator, whose facilities are not used economically because of forced full line policies.

67. The operation of the present structure of the oil industry has resulted in the production of crude oil, necessary for the safety of the nation, not on true conservation principles, but on the principle of price maintenance.

68. Each of the four branches of the industry is dominated and controlled by the 22 defendant majors who transact more than eighty-five per cent of the total business of the industry. In all the four branches of the industry, where normal competition once flourished, the rapid development of the completely integrated defendants has substantially destroyed competition. The possession and use of facilities and supplies provided by integration enables defendants to render ineffective and stifle existing and potential competition which defendants have combined and conspired to eliminate through the aforesaid means, methods, devices, practices and activities and their control of crude oil production, their refusal to operate pipelines as common carriers, their acquisitions of bulk plants and service stations and the successful forcing of railroads to maintain preferential freight rates. Defendant majors operate their integrated organizations in all branches of the industry as a single unit and the profits of one branch are used to subsidize operations in branches in which competition exist, thus enabling the defendants to enjoy unfair competitive advantages over independent competitors. Operating on an integrated basis, the defendants have purposely neglected and failed to compute investments in, incomes from, and costs of operations of, each of the various branches in order to conceal the results and effects of their illegal purposes and practices.

69. Unless enjoined by this Court the defendants will continue to violate the Acts of Congress in the manner heretofore alleged.

'Divorcement' Not Included In Relief Asked of Court

VII
PRAYER

WHEREFORE, PLAINTIFF PRAYS:

(1) That summons issue directed to each defendant, including those residing or having offices outside of the District of Columbia, commanding each defendant to appear herein and answer the allegations contained in this complaint and to abide by and perform such acts and decrees as the Court may make in the premises;

(2) That the defendant Institute be forthwith dissolved;

(3) That the provisions of the contracts of sale of petroleum products, of agency and lease with jobbers, distributors, commission agents, service station operators and commercial consumers which provide for exclusive dealings with defendants, be adjudged and decreed to be monopolistic devices and also in violation of Section 3 of the Clayton Act and be cancelled forthwith, and that the defendants herein and each of them and their respective successors be permanently enjoined from executing or entering into any contracts or leases containing similar provisions, and from concertedly adopting contracts, for the sale of petroleum products, having uniform provisions agreed upon by the defendants;

(4) That the defendant majors and secondaries and each of them be permanently enjoined and restrained from dominating or controlling or attempting to dominate or control, directly or indirectly, buying, selling, pricing and operating policies of the operators of facilities used in the marketing of petroleum products by the means herein described or by any other means whatsoever;

(5) That the discriminatory price provisions of the contracts entered into by defendants with, and the sale of products by defendants at discriminatory prices to, competing service station operators, be adjudged and decreed to be monopolistic devices and also in violation of Section 2 of the Clayton Act and that such provisions be cancelled forthwith, and that the defendants herein and each of them

be permanently enjoined from entering into future contracts for the sale of, and from selling in the future, any petroleum products to competing service station operators under similar discriminatory provisions and prices;

(6) That the defendants and each of them and each and all of their representatives, officers, directors, agents, servants and employees be permanently enjoined and restrained from directly or indirectly entering into or carrying out any contract, combination or conspiracy to fix, raise, lower, stabilize or peg prices at which the defendants purchase petroleum products, sell their petroleum products or require that others shall resell such petroleum products in the manner and by the means herein alleged or in other manner or means;

(7) That the defendants and each of them and each and all of their representatives, officers, directors, agents, servants and employees be permanently enjoined and restrained from directly or indirectly entering into or carrying out any contract, combination or conspiracy to maintain prices, margins and price differentials, concertedly fixed by defendants, in the manner herein described or in any other manner;

(8) That the defendant majors and secondaries and each of them be permanently enjoined and restrained from operating common carrier crude oil gathering pipelines as private carriers to monopolize gathering pipeline transportation of crude oil in violation of the Sherman Antitrust Act;

(9) That the defendants and each of them and each and all of their representatives, officers, directors, agents, servants and employees be permanently enjoined and restrained from directly or indirectly combining or conspiring to eliminate actual or potential competitors by coercing, inducing and agreeing with railroad companies to establish and maintain rail freight rates which are disadvantageous to competitors, by inducing and coercing railroad companies to eliminate track-side service stations, and by using bogus independents as price cutters to eliminate these competitors who are selling below the prices fixed and maintained by the defendants, and by engaging in any other activities which are designed to or have the effect of impairing the ability of such competitors to compete with defendants.

(10) That the defendants and the officers, directors, members, representatives, agents and employees of the defendant Institute be permanently enjoined and restrained from promoting, furthering, and maintaining, directly or indirectly, any combination, conspiracy and monopoly herein described, from organizing and maintaining in concert with the corporate defendants and their officers, agents or employees any organizations or committees thereof to supervise, enforce or make effective those illegal policies, programs, and practices adopted and agreed upon by the defendants as herein described, on any similar policies, programs and practices;

(11) That the combinations and conspiracies to restrain and monopolize the trade and commerce among the several states of the United States, with foreign nations and within the District of Columbia, together with the attempts to monopolize and the monopolization of said trade and commerce and contracts in restraint thereof, hereinbefore described, be declared illegal and in violation of the Sherman Antitrust Act;

(12) That the defendants and each of them and each and all of their representatives, officers, directors, agents, servants and employees, and all persons acting or claiming to act on behalf of the defendants, or any of them, be permanently enjoined and restrained from continuing to carry out, directly or indirectly, expressly or impliedly, the contracts, combinations and conspiracies to restrain and monopolize, the attempts to monopolize and the monopolization of said trade and commerce in petroleum and its products, and from entering into and carrying out any contracts, restraints, attempts to monopolize and monopolies similar to those herein described;

(13) That the defendants and each of them be permanently enjoined and restrained from directly or indirectly acquiring, pursuant to any agreement, arrangement or understanding, any part of the crude oil reserves of the United States when the purpose or effect of such acquisition is to restrain or monopolize any part of the above described interstate of foreign trade or commerce;

(14) That the defendant majors, their subsidiaries and affiliates, and each of them be permanently enjoined and restrained from concertedly engaging, with any other defendant major or its subsidiaries and affiliates or with any other person, firm or corporation in the petroleum industry, in any activities which are designed to or have the effect of reducing and restricting the amounts of crude oil produced or the amounts of petroleum products manufactured by defendants or others;

(15) That the defendants and each of them and each and all of their representatives, officers, directors, agents, servants and employees be permanently enjoined and restrained from directly or indirectly entering into or carrying out any contract, combination or conspiracy to fix, raise, lower, stabilize or maintain prices for the purchase or sale of crude oil in the manner herein alleged or in any other manner;

(16) That the plaintiff have such other and further relief with respect to the organization, functioning and operation of the defendants as the Court may deem proper; and

(17) That the plaintiff recover its costs herein.

UNITED STATES OF AMERICA
EDWARD M. CURRAN
U. S. Attorney for the District of Columbia
ROBERT H. JACKSON
Attorney General
THURMAN ARNOLD
Assistant Attorney General
MAC ASBILL
Special Assistant to the Attorney General
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Special Assistant to the Attorney General
H. DOUGLAS WEAVER
Special Attorney

Jackson Tells Sen. Gillette About Action

WASHINGTON, Sept. 30.—Following is complete text of Attorney General Jackson's letter to Sen. Gillette, in which Mr. Jackson explains why divorcement was not asked in oil suit and recommends that Congress enact legislation for "conservation and orderly utilization" of our petroleum resources:

September 28, 1940
Honorable Guy M. Gillette
United States Senate
Washington, D. C.

My dear Senator:

After considering your letter of September 18, urging commencement of the suits proposed by the Antitrust Division against the petroleum industry, and after studying the report of the Defense Commission, I beg to answer your letter as follows:

As national defense is the paramount problem facing the American people today, I am accepting the recommendations of the National Defense Advisory Commission and, in accordance therewith, have taken the following steps:

1. The Defense Commission advised me that it would wholeheartedly approve "any appropriate legal action brought to eliminate such restraints on competition where they are proven to exist." In accordance therewith I have authorized the Antitrust Division to commence the proposed civil action so far as it seeks to prevent existing abuses in the oil industry, including price-fixing, discriminations, and all practices which tend to restrain or prejudice the independents in the industry or to jeopardize the interests of consumers.

2. The Defense Commission indicated that a court decree of divestiture at this time would create a number of serious problems for the national defense. Accordingly, this action does not seek at this time to compel the oil companies to get rid of their pipe lines, barges, or other facilities for the transportation and distribution of petroleum. I believe there might be serious consequences from a disruption of these facilities at a time when we have no capital presently willing, so far as I am able to ascertain, to acquire and operate these facilities by themselves.

3. The National Defense Commission, however, referring to the divestiture phase of the case, says "the Commission does not suggest that the proposed suit should be abandoned." It is not being abandoned, and no action is being taken inconsistent with divestiture proceedings, either in a later action or by amendment of proceedings in the existing suit if, at the time of trial it shall appear that the abuses in the oil industry can be corrected in no other way.

I noted with interest your suggestion that you "must not let this session of the Congress be adjourned or recessed without some action relative to" certain legislation which you have sponsored. I see no reason why the pendency of this action in any form should interfere with or delay legislative consideration of the problems of the oil industry. We know from the history of antitrust cases that many years lapse between commencement of a case and its ultimate decision.

Moreover, court decrees are in the main negative affairs forbidding certain acts, combinations and contracts. They do not necessarily lead to constructive steps in industry. In shaping legislation the Congress can provide a comprehensive and constructive plan.

The statement most significant to me in the report of the Defense Commission has been almost wholly overlooked in the discussion of these cases. It states "though by simple arithmetic it would appear that the country's reserves are good for more than ten years under emergency conditions, declining production and higher prices for petroleum will arrive long before exhaustion of reserves unless the discovery rate is maintained and production is effected with a minimum of waste." The very fact that in considering national defense we begin to calculate the life of our oil reserves in such small figures is an ominous sign for national defense and for our economic life.

In advocating revision of the antitrust laws over three years ago to make them effective and clear, I repeatedly said that in my opinion the doctrine of compulsory competition embodied in the antitrust laws is unwisely applied to oil production where the principle of conservation of an exhaustible and irreplaceable national resource should replace the principle of competitive exploitation. The companies seem to recognize this for they have tried to limit depletion by devices of their own, but without representation of the public interest or the consumer welfare, or that of smaller producers. Private conservation plans which restrain or discriminate against independents and disregard consumer interests violate the antitrust laws, but they should not be replaced by a headlong race to exhaust petroleum supplies, but rather by a conservation plan which will be in the public interest.

Only Congress can protect the future economic life of this country by protecting oil reserves in the ground. It has made several efforts to do so, some of which have failed. I believe more comprehensive plans could be devised now which would be successful. Litigation by itself will never completely accomplish the wise utilization of this great asset by this generation or its conservation for the future.

Therefore, I urge that you do not let the pendency of litigations delay or deter the Congress from giving this basic industry consideration in the interests of conservation and orderly utilization of our basic petroleum resources.

With high regards and good wishes, I am

Sincerely yours,
ROBERT H. JACKSON
Attorney General.

Refining Technology

INCLUDING INTERNATIONAL PETROLEUM TECHNOLOGY

RECLAIMED OIL Re-refining of crankcase drainings is being given careful attention now in England where, in the past, the attitude of distributors has opposed its use and little progress has been made by the few small enterprises trying to make a go of reclaiming lubricating oil. Reputable technologists are now changing these attitudes and British distributors are being told that "crankcase drainings can be refined into lubricating oil indistinguishable from straight oils incorporated in new motor oil" and that the average cost of recovery in war-time is definitely lower than the new oil.

This being the case, the setting up of plants in England for the re-refining of oil during present conditions will make it reasonably sure that the organization of a system for collecting and refining crankcase drainings will not be immediately scrapped when conditions improve unless price differentials are greater than they have been in the past.

Charles I. Kelly, well-known British oil technologist, in drawing attention to the British lack of "lubricating-oil-consciousness" in connection with conserving England's supplies of lubricating oil, pointed to 110 firms in the U. S. recovering lubricating oil from crankcase drainings, one of which was said to recover 40,000 tons annually, about 1% of U. S. demand. Germany has been very active in developing reclaiming processes and is expected to recover 60,000 tons this year, he said.

Mr. Kelly was careful to point out that the general composition of crankcase drainings made fundamental treating methods necessary in re-refining but that many arguments opposed to use of reclaimed oil have no substance or backing. These, he said, can be ruled out in these times "because the petroleum industry encourages lubricating oil recovery, because members of the Oil Distributors' Emergency Council are pledged to put the national interest first, and used oil recovery is a well-established commercial practice." The possibilities of producing lubricating oils in this manner in England was figured on the basis of a yield of 80-90% of the fully refined oil.

While reclaiming of lubricating oil has been practiced successfully in the U. S. a number of years for reconditioning industrial lubricating oils and by fleet operators, it is only in the marketing of reclaimed oils to motorists that trouble has been experienced. The low cost of new oils has made it unprofitable generally to reclaim used oils by processes which do more than a superficial job. The result has been that many reclaimed oils on the market are low quality products sold under misleading claims. Marketed reclaimed oil in the U. S. is, therefore, likely to remain in a class with low grade oils as long as new oils are available at present low price levels.

* * *

CO-OPERATION FOR SAFETY One of the major problems, if not THE major problem of a safety program or accident prevention campaign is in obtaining the co-operation of employes. Who has not seen the occasional resentful attitude of certain employes or even in the management against someone coming into the refinery who "thinks he can tell us how to run our own business?" It takes rare tact to bring some of these fellows around to real safety-mindedness.

If you have met this kind of a problem and need some new lines of attack to stimulate employes into whole-hearted support of various phases of accident prevention, the place to get them is at a panel discussion of this subject in the Stevens Hotel, Chicago, Oct. 8 in a meeting of the Petroleum Section of the 29th National Safety Congress.

This is but one feature of the meetings of the Petroleum section. Opening the above session will be a discussion of photography as a means of education in accident prevention. Other sections and sessions will also include speakers whose messages will be of direct interest in the petroleum industry. Thus, the Commercial Vehicle Section will be of particular interest considering the nature of the load carried by most oil company trucks. Special sessions not classed under any single industry include Fundamental Causes of Accidents, Health Service in Industry, Maintaining Interest in Safety, Occupational Disease, Off the Job Accidents, Psychology and Safety, and Safety Training.

* * *

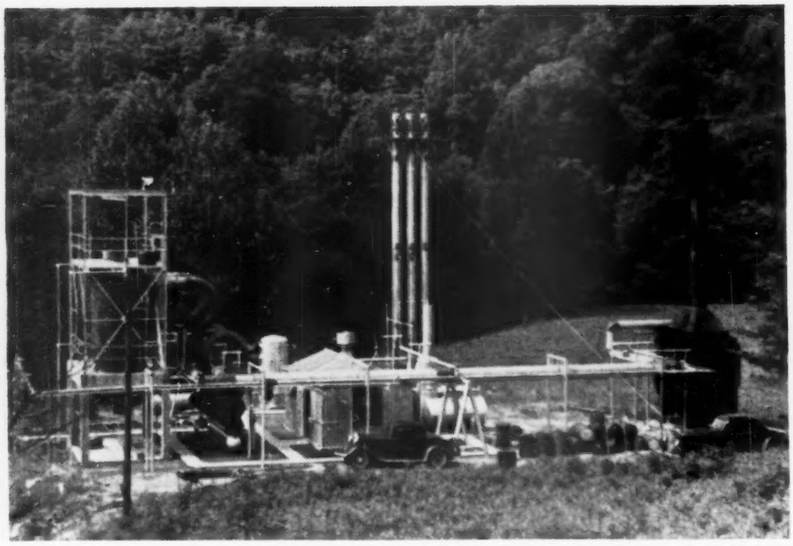
CHEMISTS FOR DEFENSE The defense program of the United States now has the co-operation of the American Chemical Society with its 25,000 members in preparing a census of over 70,000 American chemists and their qualifications and specialties. While no one can predict the actual value of this step, its potential value is proved by the service rendered during the last war. Past experience has proved that there can be much waste through the failure to realize the far greater value of certain professional and technical men when performing tasks for which they were trained than when manning guns at the front.

The work will be financed by the society and will be directed by E. M. Billings, Eastman Kodak Co. It will be related to a national project to assemble a roster of scientific and specialized personnel, of which Dr. Leonard Carmichael, president of Tufts College, is director. The A.C.S. acted in accordance with its charter which provides for investigation and reporting on chemical subjects related to national defense whenever called upon by the War or Navy departments.

Codes, being developed, and means to be provided for mechanically sorting cards according to particular subjects will enable quickly selecting men for specific tasks as they may arise.

* * *

WHAT'S GREASE COMING TO? This week the National Lubricating Grease Institute took stock of itself at its annual meeting in Chicago by reviewing its past and surveying the present and future uses of greases in agriculture and industries of the various sections of the country. The program was somewhat different than programs of the past few years in that little outside talent contributed to it. Instead, some of the best speakers of the institute were asked to contribute from their experience by describing conditions in areas which they serve and in this way a considerable portion of the U. S. was covered authoritatively. It was an interesting meeting about which more will be published in the next Refining Technology edition.



The catalytic desulfurization unit consists essentially of the two catalyst chambers at the left, three heat exchangers by their side, pump house, three washing towers, and furnace at the right

Catalytic Desulfurization Solves Problem in High-Sulfur Distillate

By James E. Pew[1] and A. E. Buell[2]

ABSTRACT

A treating unit for catalytic desulfurization of 1000 barrels per day of gas well distillate and natural gasoline has been installed by the Virginian Gasoline and Oil Co. at one of its plants near Charleston, W. Va. The unit reduces sulfur content of 0.257% in 8.5-pound natural gasoline to .004% with a gain of 2.7 octane numbers and improvement of 7.5 numbers in response to 1 cc. of lead. Total operating costs average 5.6 cents per barrel.

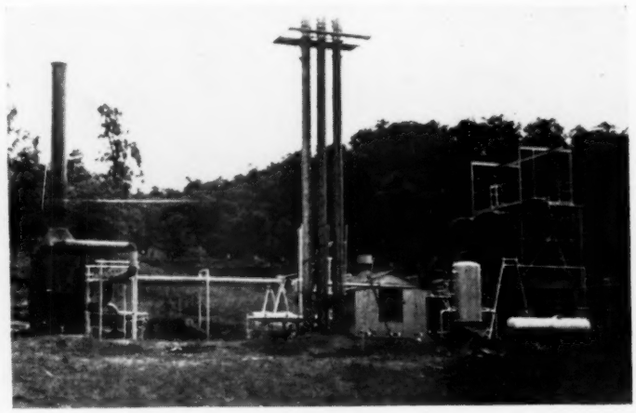
The process is extremely simple. Sulfur compounds are decomposed and sulfur converted to hydrogen sulfide. Catalyst towers operate at 750° F. and maximum pressure in the unit is 40 pounds. The yield is 4000-5000 barrels per ton of catalyst. The catalyst, prepared from natural bauxite, is discarded after about four weeks.

EARLY this year Virginian Gasoline & Oil Co. installed a Perco catalytic desulfurization unit at its natural gasoline plant near Clendenin, W. Va. A brief description of the operations at this plant will serve to explain the reasons for processing the products of this plant for sulfur removal, and as a background for the more detailed description of the new unit and the results that have been achieved.

At this plant the lighter fractions of the natural gasoline are sold as raw material to chemical plants and the pentane-free gasoline is disposed of in motor fuels. These fuels were formerly prepared by blending the natural gasoline with purchased high octane cracked gasolines and naphthas, and adding tetraethyl lead to the required octane specification.

Following the development in the last few years of nearby deep sand gas fields, the plant received considerable quantities of high-sulfur condensate that is recovered from drips at the gas wells. Much of this condensate, usually referred to as distillate, is also disposed of in motor fuel. At the same time there has been a rapidly increasing ratio of high sulfur gas coming to the plant from these fields, along with the relatively sweet gas from the older shallow fields. With the mounting octane requirements of the last year, it became difficult to meet octane and sulfur specifications in the motor fuels except by the use of excessive quantities of tetraethyl lead and purchased low sulfur-high-octane blending materials.

The lead susceptibility of the natural gasoline and the



A rear view of the treating unit gives prominence to the three washing towers in which hydrogen sulfide is separated from treated product

[1] Virginian Gasoline & Oil Co., Charleston, W. Va.
[2] Perco Incorporated, Bartlesville, Okla.

distillate was very poor because of the high sulfur content. The sulfur content of the pentane-free natural averages about 0.25%, and that of the distillate about 0.30%. Several methods of partially removing this sulfur, such as mercaptan extraction by multiple-stage washing with alkaline solutions, or treatment with sulfuric acid, were tried but without sufficient success in obtaining the desired improvement in sulfur reduction or savings in tetraethyl lead costs to pay for the costs of the treatment.

Because of the above developments, it was decided to install a Perco catalytic desulfurization unit of 1000 barrels a day capacity to operate alternately on the gas well distillate and the natural gasoline. Samples of these high sulfur gasolines were given pilot plant tests to serve as a basis of design for the unit.

Pilot Plant Tests

The pilot plant tests included a run made on a sample of distillate of higher than average sulfur content. The results obtained on this sample, given in Table I are an outstanding demonstration of the effects of catalytic removal of sulfur compounds on improving lead response. This sample contained 0.425% total sulfur, and when this was reduced catalytically to 0.007%, there was a gain of 3.3 units in the original octane number and an additional increase of 10.0 octane numbers in the response to 1 cc. of lead.

Table 2 gives the pilot plant results on a sample of 8.5-pound natural gasoline of 0.257% total sulfur content. Reduction of the sulfur to 0.004% raised the initial octane rating 2.7 octane numbers and further improved the response to 1 cc. of lead by 7.5 octane numbers.

TABLE 1

PILOT PLANT TEST—Gas Well Distillate

ASTM Octane Number	Before desulfurization	After desulfurization	Improvement
+0 cc. TEL per gal.	44.8	48.1	3.3
+1 cc. TEL per gal.	50.1	63.4	13.3
+2 cc. TEL per gal.	53.9	69.9	16.0
+3 cc. TEL per gal.	55.9	73.9	18.0
Total Sulfur, per cent	0.425	0.007	...
Mercaptan Sulfur, per cent	0.212	0.001	...
Reid Vapor Pressure	8.3	9.5	...
Gravity	68.1	68.4	...

TABLE 2

PILOT PLANT TEST—Natural Gasoline

L-3 Octane Number	Before desulfurization	After desulfurization	Improvement
+0 cc. TEL per gal.	57.0	59.7	2.7
+1 cc. TEL per gal.	63.7	73.9	10.2
+2 cc. TEL per gal.	68.4	79.6	11.2
+3 cc. TEL per gal.	70.3	83.2	12.9
Total Sulfur, per cent	0.257	0.004	...
Reid Vapor Pressure	8.5	9.1	...
Gravity	77.1	77.3	...

The desulfurization process is extremely simple and operates at moderate temperatures and low pressure. The

Contents...

REFINING TECHNOLOGY

October 2, 1940

Catalytic desulfurization solves the problem of increasingly high sulfur content of distillate recovered from drips at gas wells and in natural gasoline at a West Virginia plant of Virginian Gasoline and Oil Co. Sulfur content of 0.25-0.30% is reduced to .004-.005% at a cost of 5.6 cents per barrel R-355

Fatty acid mixture with a wide range of closely controlled physical properties, yet limited to the more stable saturated acids and those containing not more than one double bond, give increased flexibility in lubricating grease manufacture R-360

Segregation of agents fn lubricating oils into polishing agents and wedging materials helps to clear up the meanings of "oiliness" and "film strength." Lubricating oil oxidation inhibitors are found to accomplish their purpose in three distinct manners R-364

Continued discovery of new uses for chemical compounds which can be derived from petroleum keeps chemists busy developing methods of separation and finding the properties and uses of new or related compounds R-366

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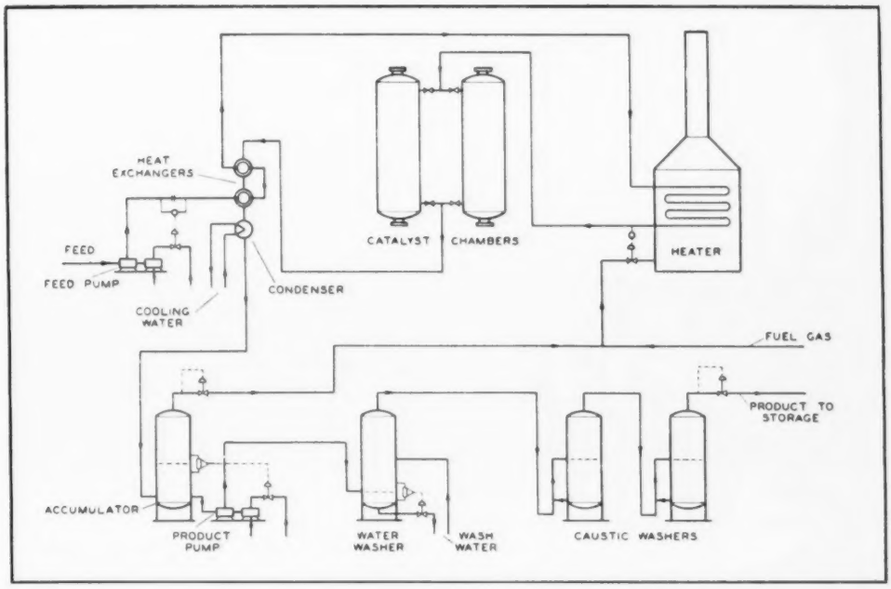

Flow-chart of a Perco catalytic desulfurization unit as installed at the Virginian plant

Reduced materially the cost of making 100 octane gasoline over other methods.

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stages in the process comprise vaporization of the feed, superheating the vapors to about 750°F., and passage of the vapors over the catalyst. During contact with the catalyst the organic sulfur compounds are decomposed and the sulfur converted to hydrogen sulfide. Removal of H_2S from the product completes the operation.

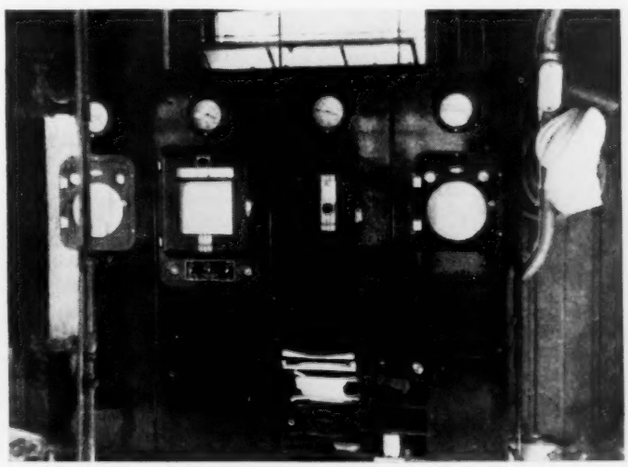
The accompanying diagram illustrates the flow in the plant installed by Virginian Gasoline & Oil Co. As shown, the feed is picked up by the charge pump and enters the tube side of a bank of three heat exchangers at atmospheric temperature and a pressure of about 40 pounds. At this plant, fuel is costly and the exchangers were designed to take maximum advantage of the heat that is recoverable from the treated vapor leaving the catalyst tower. In the exchangers the gasoline is vaporized, and the vapors leave the final exchanger at a temperature of about 520°F. and at about 35 pounds pressure. The vapors go to the furnace, leave the coil at 760°F. (when the catalyst towers are operated at 750°) and enter the top of the catalyst tower at a pressure of about 25 pounds. There is no appreciable temperature drop through the catalyst tower, and a pressure drop of four to five pounds.

THE treated vapors pass through the shell side of the exchangers where they are cooled to about 165°F. After further cooling to 85°F. in the condenser, the product enters the accumulator tank on which a back pressure of 20 pounds is maintained. Here a portion of the H_2S and the fixed hydrocarbon gases formed from the lighter sulfur compounds weathers off and is withdrawn and sent to the furnace fuel line.

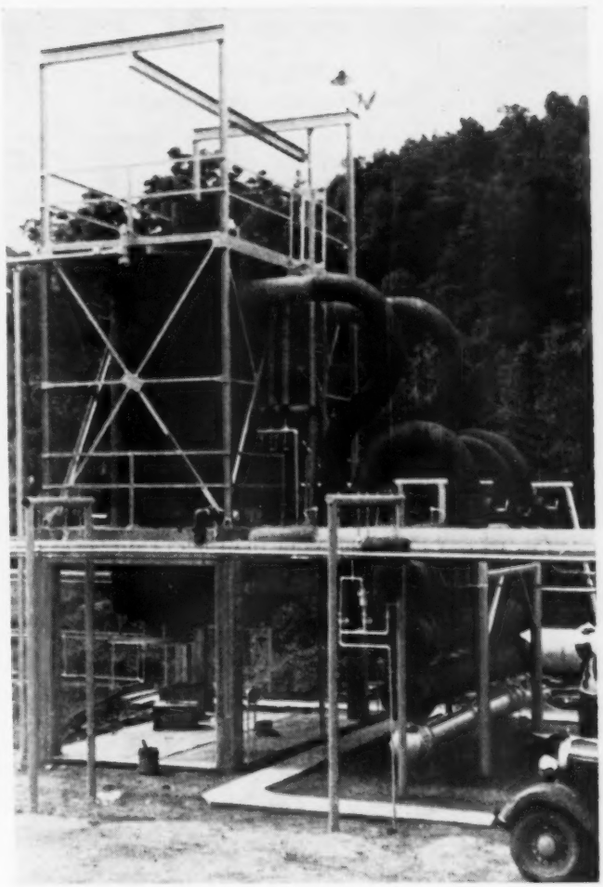
The liquid is removed from the accumulator by the product pump, which is governed by the liquid level control on the accumulator, and pumped through a water wash and two caustic washers operated in series, and thence to finished storage. This method of removing hydrogen sulfide from the product was selected in this case because of the plentiful water supply and the availability of cheap caustic soda from local chemical plants. The water removes the major portion of the H_2S. To minimize pollution of the stream into which the waste water flows, the spent wash water is heated with exhaust steam to partially strip it of H_2S. The cost of the caustic used in the final wash is approximately 0.8 cent per barrel of product.

Catalyst Not Regenerated

The plant is provided with two 5 x 15 foot catalyst towers for alternate operation, having a capacity of 6 tons of catalyst each. Because of the long life of the catalyst, no provision is made for regeneration of the catalyst when it eventually becomes spent. The catalyst is prepared from natural bauxite and costs about $44 a ton in place. The yield is 4000-5000 barrels per ton. Thus, the cycle of operation on a charge of catalyst is about 4 weeks, and the catalyst cost is approximately one cent a barrel.



The control equipment for Virginian's desulfurization unit is at one end of the pump house



A close-up of the catalyst chambers gives some idea of their size. Heat exchangers at the right bring the charge up to 520° F.

The catalyst is considered to be spent when the product becomes sour to the doctor test, although at this stage the reduction in total sulfur content is still of the order of 90% or more. It has been found that the mercaptan sulfur compounds in the distillate decompose somewhat more readily than those in the natural gasoline, and that after the catalyst has been used to treat 3500 to 4000 barrels per ton of the natural gasoline and the product begins to show a trace of sourness, the catalyst can still be used to treat an additional 1000 barrels or so of the distillate before this in turn becomes slightly sour.

THE results obtained on a commercial basis have more than confirmed the results expected from the pilot plant tests in reduction of sulfur and improvement in octane number and lead susceptibility. The unit has been operated on the gas well distillate, and both depentanized and debutanized natural gasoline. When operating on the latter natural sulfur reductions exceeding 95% have been obtained. Pentanes and other hydrocarbon cuts for special products, subsequently prepared by fractionation from the desulfurized stock, have been sweet and practically sulfur free.

Table 3 gives the characteristics of the gas well distillate before and after desulfurization, showing the results on two pairs of samples, one of which was taken when the catalyst had been in use 5 days, and the other taken on the 20th day of the same run. Table 4 gives typical results on the pentane-free natural gasoline, which has consistently shown 97-99% sulfur removal. The sulfur content of the natural gasoline has ranged from 0.195 to

0.258% before desulfurization, and 0.002 to 0.005% on the product.

TABLE 3
Gas Well Distillate Properties

ASTM Octane Number	5th Day Before desulf.	5th Day After desulf.	20th Day Before desulf.	20th Day After desulf.
+0 cc. TEL per gal.	51.8	54.2	51.4	54.0
+1 cc. TEL per gal.	58.7	67.9	58.6	67.9
+2 cc. TEL per gal.	63.7	74.0	63.5	74.3
Total Sulfur, per cent	0.170	0.001	0.171	0.005
Doctor Test	Sour	Sweet	Sour	Sweet
Color	22	23	17	11
Corrosion	Neg.	Neg.	Neg.	Neg.
Reid Vapor Pressure	11.8	12.1	11.8	12.0
Gravity	71.2	71.4	71.6	71.7
Distillation, °F.				
First Drop	90	92	89	90
10% Evap.	128	126	125	126
20% Evap.	151	151	148	149
50% Evap.	201	201	199	200
90% Evap.	284	279	285	283
End Point	370	374	368	368

TABLE 4
Desulfurization of Pentane Free Natural Gasoline

ASTM Octane Number	Before desulfurization	After desulfurization
+0 cc. TEL per gal.	51.4	54.8
+1 cc. TEL per gal.	57.5	67.8
+2 cc. TEL per gal.	61.2	74.2
Total Sulfur, per cent	0.258	0.004
Doctor Test	Sour	Sweet
Color	30	25
Corrosion	Neg.	Neg.
Reid Vapor Pressure	5.7	7.0
Gravity	69.0	69.8
Distillation, °F.		
First Drop	146	130
10% Evap.	169	164
20% Evap.	175	172
50% Evap.	191	189
90% Evap.	244	244
End Point	340	342

The catalytic desulfurization unit was installed at a total cost of approximately $30,000. Operating costs for labor, fuel, water, steam, catalyst, and caustic are $56.00 per day, or 5.60 cents per barrel. Volume losses have not as yet been accurately determined but preliminary figures show a loss of about 0.5% from raw to finished storage for either the distillate or the depentanized natural.

Study Thermal Properties

Study of the kinetics of thermal decomposition of hydrocarbons is being undertaken by P. B. Stickney, who has completed two years of post graduate work at the University of Cincinnati, at Battelle Memorial Institute. This is not the first work on petroleum research that has been carried on at Battelle. Several oil companies have financed research there, it is understood, although the institute is best known for its work in metallurgy and coal.

Metallic Barium Used as Lubricant

Under certain conditions a film of metal is a better lubricant than in a lubricating grease or oil, it has been announced by three engineers of General Electric X-Ray Corp., Chicago. Such a lubricant is not recommended for the crankcase of an automobile, however, they hasten to add. The special application of barium is to lubricate the rotation of a target in a special type of X-ray tube. Vaporization of ordinary lubricant in the high vacuum demanded by X-ray tubes makes impossible the use of petroleum lubricants. A number of metals have been used but barium proved the best both from the standpoint of long life and quiet operation.

Offer Refining Courses

Catalysis and petroleum refining will receive special emphasis at Illinois Institute of Technology during the coming academic year as a part of the Institute's program in assisting the national defense program. Courses will be in evening sessions under the direction of Dr. V. I. Komarewsky, Dr. J. C. Morrell, and Dr. H. H. Wenske.

Expands Laboratories

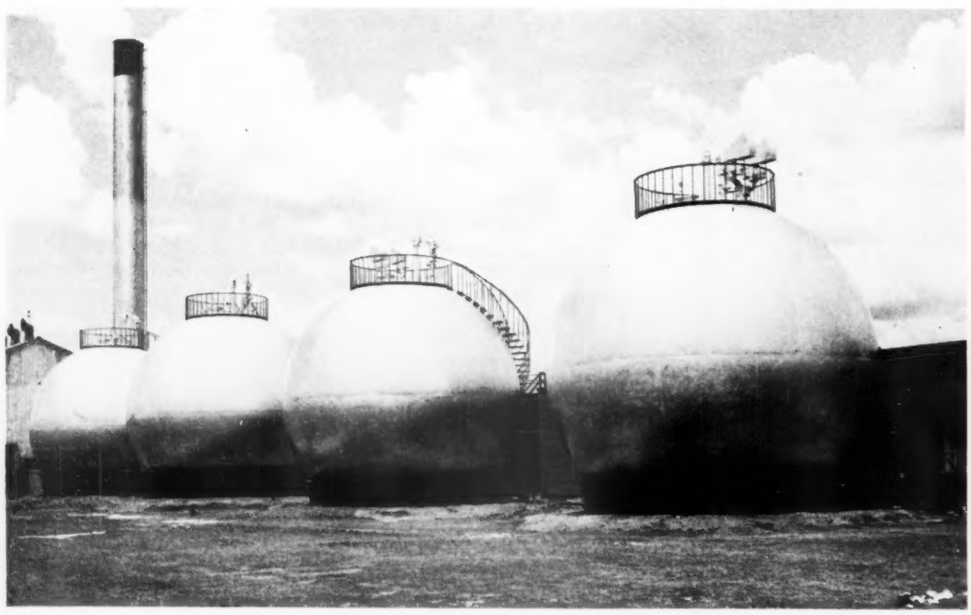
Completion of a new 30 by 80-foot two-story chemical engineering building adjacent to its present research laboratories is announced by Arthur D. Little, Inc., Cambridge, Mass. The building will be used for semi-plant development, particularly in connection with development of several projects closely related to petroleum.

Information Please

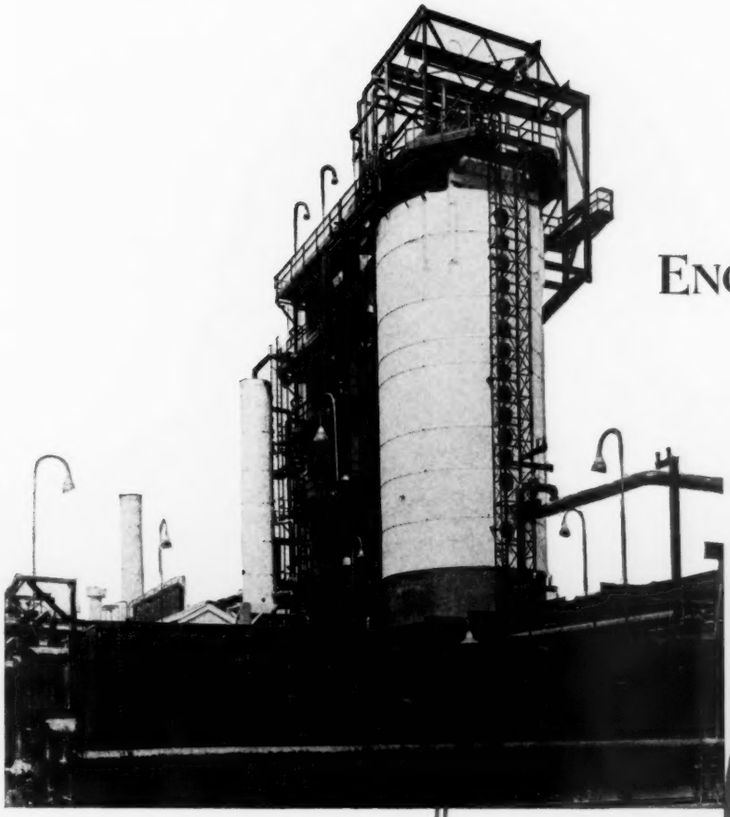
Frank C. Whitmore, Dean, School of Chemistry and Physics, Pennsylvania State College, and Gustav Egloff, director of research Universal Oil Products Co., were the least confounded of a group of four "experts" who let themselves in for an "Information Please" type of feature at the Chemists Carnival, a variety show presented by the Detroit section of the American Chemical Society, during the 100th meeting of the society last week.

Such weighty questions as identifying various glass laboratory apparatus by the sound of their smashing when dropped behind a screen were asked by Dr. Harrison E. Howe, Master Interrogator. The experts were more successful with questions in pure chemistry than in identifying chemical elements suggested by the playing of various popular songs.

Awards of five dollars were made for each correct answer but it is suspected that those formulating the questions were heaviest winners.



These four Hortonspheres are an integral part of a new thermal polymerization unit installed by Continental Oil Co. at its refinery in Wichita Falls, Texas. The two at the right hold 2500 barrels of propane-butane-casinghead mixture of 70-85 pounds Reid vapor pressure received by pipeline from the natural gasoline recovery plant stabilizer in the K.M.A. crude field. Stabilized propane-free polymer distillate of 10 pounds Reid vapor pressure is stored in the other two 2000-barrel tanks. Courtesy of Chicago Bridge & Iron Co.



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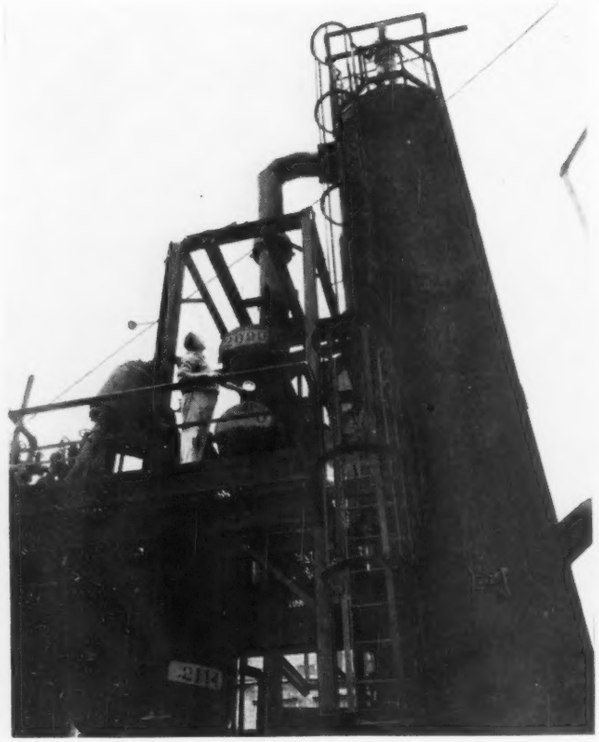
Versatility in Fatty Acid Selection Sharpens Control in Grease Making

By Dale V. Stingley*



Newly developed distillation equipment especially designed for commercial production of fatty acids has given lubricant manufacturers an almost unlimited choice of combinations of fatty acids blends

ABSTRACT

The use of fatty acids in imparting better oiliness to lubricating grease has been handicapped in the past to a narrow field of natural products such as tallow, greases, oils, straight distilled fatty acids, pressed acids, and more recently, hydrogenated fat derivatives. Little control could be exercised in the choice of raw materials until a method was developed for producing commercial quantities of fatty acid mixtures with a wide range of physical properties.

While fatty acids cannot be used alone as lubricants they possess the valuable characteristic of greater oiliness than almost any other group of compounds and less than 1% will give a lubricant a coefficient of friction of about that of the polar compound alone. Fatty acids of suitable stability are limited to saturated acids and those containing not more than one double bond.

THE use of fatty acids and their derivatives in lubricants is in many respects an unexplored field. Modern lubricants of the soap-thickened-mineral oil type which are our chief concern, really date from the discovery of oil in Pennsylvania around 1859 and whereas in its earlier stages grease-making was considered an art to be passed on from father to son, it has at the present time developed into a closely controlled chemical process, designed to supply the precision demands of modern mechanical science.

During this development, a most peculiar condition has arisen and to the uninitiated at least, it is difficult to reconcile the rapid advances in petroleum chemistry, with the almost negligible research devoted to fatty acids and their derivatives. The answer to this lack of knowledge is of course very simple. Purified fatty acids were not available commercially, and as many experimental results obtained were to all intent and purpose merely contributions to pure science, little if any commercial research on this subject was attempted.

The essential function of any lubricant is the reduction of friction, and recent studies on this subject have shown that basically all lubricants accomplish this result in much the same manner. Several investigators (1) demonstrated that the orientation of polar molecules on a solid surface produced a layer of molecules on the surface, which by its structure facilitates tangential slippage. Further investigation has demonstrated that the persistence of these films under varying conditions of pressure and temperature is in a major way the measure of their oiliness and also that compounds which reduce interfacial tension assure better wetting of the contacting surfaces and facilitate film formation. The importance of polar molecules is now well appreciated and a considerable amount of basic research has been devoted to this field.

Bearing in mind that fatty acids and their derivatives are usually strongly polar molecules and that generally speaking most of these compounds reduce interfacial tension, it is to be expected that a considerable number of these compounds will exhibit high lubricating value. Acids RCOOH, acid anhydrides $(RCO)_2O$, alcohols ROH, aldehydes RCHO, ketones RR'CO, salts and esters RCOOR', acyl halides RCOX, amides $RCONH_2$, nitriles RCN, amines RNH_2, R_2NH, R_3N, and other lesser known compounds all fall within this classification but due to chemical reactivity or unstability many of these groups cannot be utilized. R signifies here a hydrocarbon radical of from 8 to 24 carbon atoms in length.

Fatty Acids Have High Oiliness

It is indeed unfortunate that fatty acids in themselves cannot be used as lubricants inasmuch as they possess greater oiliness than almost any other group of compounds. The addition of as little as 1/10 of 1% of oleic acid to mineral oil has been shown (2) sufficient to reduce greatly the value of the static coefficient of friction. The presence of 0.7% or more of a polar compound in a lubricant was reported (3) to insure a coefficient of friction of the order of that for the polar compound alone. It was found also (4) that the presence of small amounts of fatty acids caused a rapid drop in surface tension.

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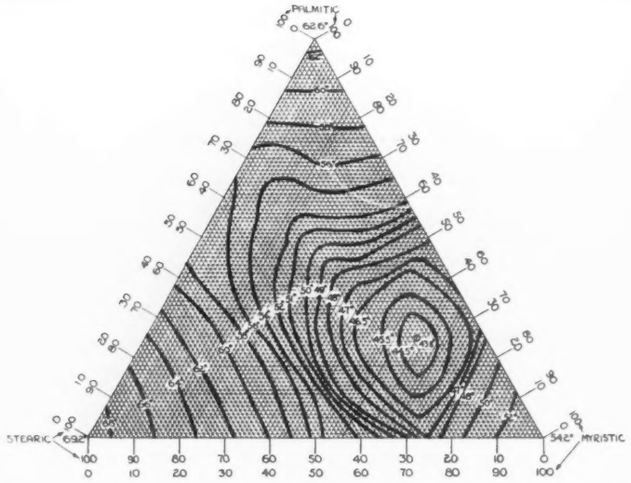

The versatility in selecting physical properties of mixtures of fatty acids is illustrated by these melting point curves

greases to the presence of small amounts of free fatty acids or to acid soaps but there is evidence (5) indicating that soaps are adsorbed on metallic surfaces to a considerable extent in disagreement with this theory. There is considerable evidence to show that acid soaps, which may be defined as a molecular combination of one molecule of fatty acid and one molecule of soap reduce interfacial tension to a marked degree and form monomolecular films. Inasmuch as acid soaps develop readily during hydrolysis or when an excess of fatty acid is present, it would seem probable that their importance in lubricants has been neglected.

The addition of small amounts of active molecules to mineral oil so that molecular films will form on the rubbing surfaces has been suggested (6). This has become almost standard practice in lubricating oils from which modern refinery methods have removed almost all polar molecules. The chlorinated esters of higher fatty acids in particular have found wide application in this field. In greases the addition of monoglycerides and higher alcohols was found to be beneficial (7). The value of higher ketones and nitriles in lubricating oils has been demonstrated (8) also and it is possible that compounds of this nature will prove desirable additives in greases.

Physical Properties of Greases

In addition to lubricating value the grease-maker's chief concern is in controlling the physical properties of his greases. Metallic soaps are used almost exclusively for this purpose and while some work has been reported in this field, little if any results pertaining to the fatty acid radicals themselves are available. The fatty acid radical to a large extent governs the physical properties of metallic soaps according to one authority (9). An extensive study of metallic bases which should prove an excellent starting point for a study of the effect of fatty acid radicals themselves was reported by another authority (10).

In the past the grease manufacturer has been limited to a narrow field of natural products such as tallow, greases, oils, straight distilled fatty acids, pressed acids and more recently, hydrogenated fat derivatives. All these products are either mixtures of fatty acids or are composed of mixed glycerides of fatty acids. Although these materials may be roughly divided into 4 different classes according to their fatty acid compositions (11), little control could be exercised in the choice of raw materials for grease making. However, this picture has now been changed since pure fatty acids and controlled mixtures of fatty acids have been available commercially.

These new products are produced by a fractional distillation process especially developed for commercial production of fatty acids. This development has greatly stimulated research in the entire field of fats, oils and fatty acids. An unusual series of unsaturated fatty acids and synthetic drying oils produced from these acids have been made available and in addition a complete series of saturated acids from caprylic (8 carbons) to behenic acid (22 carbons). These products are widely used by the chemical industry, rubber, buffing, soap, textile and other industries. In the field of lubricants in particular an almost unlimited choice of combinations of fatty acids blends may be prepared to obtain various physical and chemical properties not now available in natural fats and oils.

This versatility in selecting physical properties of mixtures of fatty acids is well illustrated by the accompanying melting-point curves of the three component systems, myristic—palmitic—stearic acids. A melting point range of from 43°C. to 68°C. (109°F. to 154°F.) is available in this system alone and modern manufacturing methods make it possible to produce and control these mixtures at will.

Eutectic Mixtures of Fatty Acids

Another field previously neglected is the utilization of eutectic mixtures of fatty acids. Eutectic mixtures possess a dense, wax-like physical structure, combined with low melting point, and are in many other respects markedly different from ordinary fatty acid mixtures. Their metallic soaps have not been investigated thoroughly but preliminary studies of the aluminum di-stearate-palmitate eutectic indicate better temperature tolerance in aluminum greases than either the stearate or palmitate alone.

It was also determined in his study that the solubilities of the metallic soaps of pure acids vary almost directly with the solubility of the acid itself in petroleum oils. This factor should be of interest to the manufacturer of special greases, such as journal greases, where it is not desirable to have excessive solubility. The conclusion was reached (12) that detergent activity in soaps and oiliness in lubricants ran parallel to capillary activity. This is of particular interest in view of the results obtained with controlled mixtures of fatty acids in the preparation of soaps for detergents.

As an example of the results of such studies in other fields may be mentioned the development of two new commercial soaps, for home and laundry use, utilizing fractionated fatty acids and which have been completely compared and tested against similar type soaps made from natural fats and oils. It can be demonstrated that these new soaps have fully twice the cleansing power of soaps prepared in the ordinary manner from natural fats and oils. While the problems of preparing soaps for detergent uses and soaps for grease making are not necessarily parallel, these results do indicate improvements which may well carry over into the lubricating grease field.

Another problem common to both these industries is the question of stability. Investigations have shown that fatty acids containing more than one double bond produce unstable soaps. Fatty acids developed as a result of this conclusion have proven suitably stable in greases to justify this theory and barring the development of more effective anti-oxidants it would seem that suitable grease-making fatty acids must be limited to saturated acids and those containing not more than one double bond, such as oleic acid.

While it is impossible to predict what new developments the future has in store, it can be said with certainty that modern machines will continue to make more exacting demands on the lubricating engineer, and in order to meet these demands no grease manufacturer can afford to neglect the new fields opened up by our wider knowledge of fatty acids and their derivatives.

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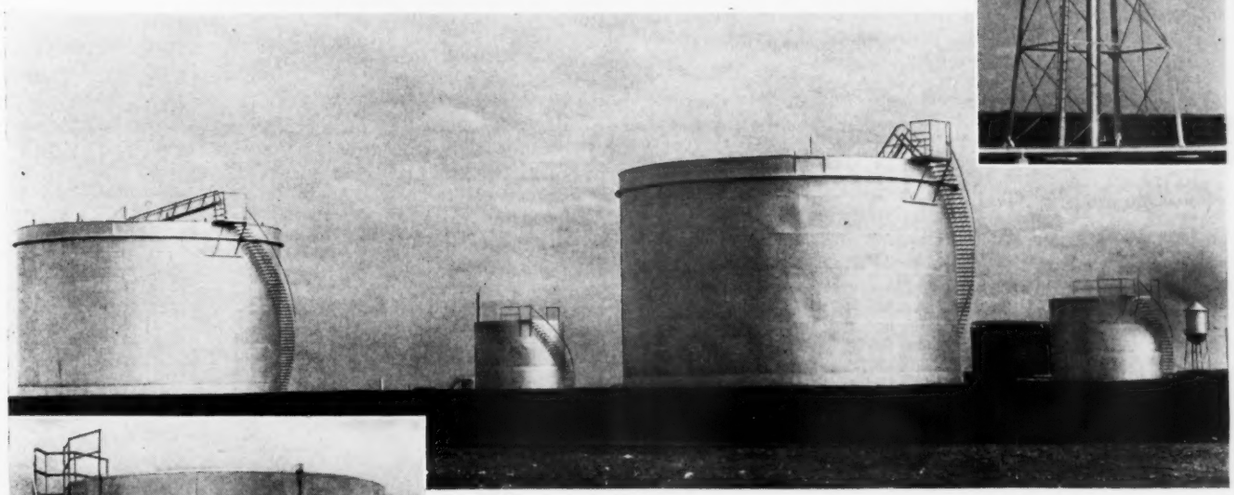

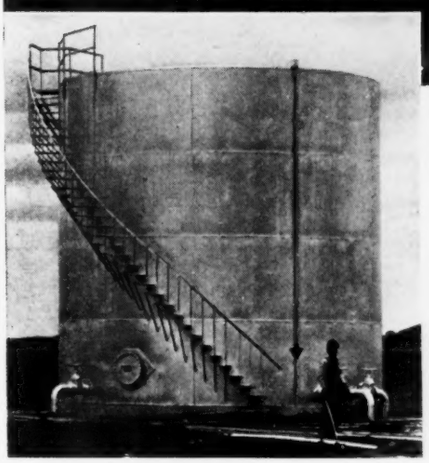

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Boundary Lubrication Explained By Polishing and Wedging Agents

THE meanings of the terms "oiliness" and "film strength" of lubricating oils are becoming clearer as the result of studies being conducted in Shell Development Co. laboratories, it was concluded by Otto Beeck, J. W. Givens, A. E. Smith, and E. C. Williams at the recent 100th meeting of the American Chemical Society.

The successful segregation of addition agents into chemical polishing agents and wedging materials has made the relations between the chemical and physical aspects of boundary lubrication much clearer, the authors feel. Furthermore, in distinguishing between wear-preventing agents and agents for extreme condition, it has been shown that the former are corrosive in transition only and do not produce an abrasive anti-welding agent between the surfaces. The latter are mainly anti-welding agents which prevent breakdown and excessive mechanical wear through chemical wear.

The authors point out that it has been generally expected in the past that any material that would reduce the coefficient of friction would also reduce the rate of wear. Now it is certain that so-called "oiliness compounds" which lower the coefficient of friction under boundary conditions do not necessarily lower the rate of wear, but often increase it.

The friction and wear studies were made using the four-ball bearing machine. In segregating the two classes of wear prevention agents, wedging agents were defined as "those long-chain polar compounds which electron diffraction experiments show to be adsorbed on the metal surface to highly oriented layers, the long carbon chains perpendicular to the surface. Their presence produces a more rapid transition from boundary lubrication to quasi-hydrodynamic lubrication.

"Chemical polishing agents increase the load-bearing surface by corroding off the high points which initially carry the load. Their effectiveness is largest when they form compounds which can combine with the surface to form low-melting alloys. Wear reduction factors up to 7 (as compared with white oil) have been found for chemical polishing agents, and factors up to 17 for combinations of chemical polishing and wedging agents."

The first part of the paper dealt especially with the action of long-chain polar compounds as studied by electron diffraction. Coefficients of friction were studied as a function of sliding velocity, thus bringing out "a new frictional effect, not previously reported in the literature, which may be directly correlated with the orientation of the adsorbed lubricant film." Results of these studies indicated that the observed effect of low coefficients of friction at higher velocities is produced by oil drag under the surface and that this wedging of oil is a property which is imparted to it by a certain surface activity.

All friction experiments were carried out with highly polished steel balls. The fact that wedging effect can not be observed with rough surfaces was taken as an indication that long chain polar compounds do not act as protective layers in cases where the load is carried by a relatively small fraction of the surface. The load is distributed evenly over the apparent surface of contact of highly polished surfaces and sliding can take place without immediate disruption of the surface film.

The four-ball apparatus was invented by the late G. D. Boerlage of the Delft laboratory of the Royal Dutch-Shell Group

Addition Agent Polishers

In the second part of the paper addition agents which have the ability to polish the metal surface were discussed. This class of compounds acts through a mechanism totally different from the action of long-chain polar compounds, but it was pointed out that the use of long-chain polar compounds, if introduced with polishing agents, is highly effective from the standpoint of wear prevention. The authors' studies started with the investigation of tricresyl phosphate, a known wear-preventing agent. Four-ball test results led them to suspect that this agent was helping to cause and to maintain a higher polish of the surface by preferentially corroding away the isolated spots. The importance of both temperature and of chemical action was experimentally demonstrated separately and conclusively with two series of experiments, it was brought out.

Careful study of the chemistry of the systems involved has shown an effect peculiar to phosphorus and not to sulfur. This is the formation of a metal phosphide which

alloys with the metal surface, lowering its melting point, and aiding greatly in maintaining a polish. A similar reduction of the melting point by sulfur or chlorine on an iron or copper surface is not possible.

In view of this action of tricresyl phosphate it was thought desirable to use a phosphide to start with. The use of other elements for addition agents was also suggested. Remarkably high wear prevention factors were obtained with triphenyl phosphine and triphenyl arsine but there were also indications that chemical disturbances may completely nullify the polishing action. The fact that the studies were made with balls of different metal showed that it is not possible to speak precisely of wear preventing addition agents or chemical polishing agents without specifying the metals for which they are suitable.

The effect of polar compounds in combination with tricresyl phosphate and triphenyl phosphine is most striking, it was found. The combinations are about 20 times as effective as the polar compound alone and two times as effective as either polishing agent alone. In the case of triphenyl arsine, the addition of 1% of mesityl heptadecyl ketone increased the wear prevention factor from 12.2 to 17.6.

The material contained in this paper has already attracted considerable attention the past summer, having been presented before the American Physical Society, the recent Massachusetts Institute of Technology Conference on Friction and Surface Finish, and is to appear shortly in the Proceedings of the Royal Society (London).

Surface Active Substances

"The presence of substances in a lubricating film which are preferentially attracted to the metal surfaces of a bearing, or segregated upon them exerts a profound influence on the resistance to motion of the surfaces between which the lubricant is introduced," it was brought out by A. W. Burwell and J. A. Camelford, Alox Corp., in a paper on "Some Effects of Chemical Composition on Lubricants Operating in the Region of Boundary Lubrication."

"Recognition of the fact that wetting of the metal by the agent employed is a prime requisite of all lubrication implies in itself that some type of activity is required . . . . Most of the effective extreme pressure lubricants used in modern hypoid gears are so active that positive attack of the metal surfaces frequently occurs and is tolerated as a not altogether undesirable complement to the use of this type of lubricant."

The "oiliness" and "film strength" properties of lubricants were said to be due entirely to some sort of activity and "in a final analysis transition from 'oiliness' effects to those of film strength' and finally to those of extreme pressure lubrication may possibly be measured by the intensity of these forces." While no convenient technique for measuring these forces was offered, a method was described by which a series of comparisons of boundary lubrication effects between a number of lubricants could be made.

The apparatus used in this method consists of a partial journal bearing with bronze bearing elements fitted to and pressing on a hardened steel shaft driven by a DC motor. During test runs measurements are made of the maximum power input required at the instant at which motion of the journal commenced and also for the power input required to bring the motor and shaft into motion with the bearing elements not in contact with the test shaft. The difference between the two values then represented the net power input required to overcome friction of the system to permit of motion under the specified conditions. Bearing pressure and temperature were carefully controlled.

Lubricant Additive Progress

Progress in the use of additives in automotive lubricants was presented by F. L. Miller, W. C. Winning, and J. F. Kunc, Standard Oil Development Co. Progress toward use of additives is so rapid today, they believe, that their general use is now only a matter of time, particularly as demands are becoming more severe.

Probably the principal contribution in this paper is the bibliography of 31 published articles and the classified list of over 400 of the more recent additive patent numbers arranged under 28 sub-headings referring to types of compounds, and under 5 main divisions indicating the purpose for which the agent is added.

Oxidation Inhibitors Act 3 Ways

Three distinct actions of naturally occurring or added oxidation inhibitors in lubricating oils were described by L. L. Davis, B. H. Lincoln, G. D. Byrkit, and W. A. Jones, Continental Oil Co., in summing up a report on methods of studying oxidation of lubricating oils. First is "a true anti-oxidant characteristic which increases the induction period, second, a 'precipitating' action which removes or counteracts the effect of metallic accelerators, and third, the formation of protective films on metal surfaces which retard corrosion and therefore the formation of oil-soluble metallic accelerators.

Sulfur-bearing esters of the "methyl-S-linoleate" type and sulfurized olefins derived from petroleum wax were said to have all three characteristics to a marked degree. "So-called anti-oxidants such as those of the amine and polyhydroxy aromatic types may have a remarkable effect by increasing the induction period, but have no effectiveness against metallic accelerators."

"The final proof of ability of a lubricant to withstand oxidation must be in practical lubrication tests such as actual engines runs," the authors state. "The physical and chemical changes in the oil during use are an accurate measure of the rate of oxidation, but the final determination is the effect the oxidation products have on the engine."

The study of oxidation of lubricants was divided into three parts: oil oxidation and factors determining its rate, quantity and kind of oxidation products produced, and effect of oxidation products on an engine or other equipment being lubricated. Lubricating oil oxidation was considered to be auto-catalytic in character, involving a chain mechanism. The reactions, both in the laboratory and in engines, show an initial or "induction" period of very slow oxidation, a second or "transition" period in which the rate accelerates rapidly, and a third period of high oxidation rate.

Studies of induction period do not indicate the value of a lubricant in service, it was pointed out. "Although a long induction period is desirable, it must be remembered that in any lubricating system, and particularly in an engine, the fresh oil is almost immediately contaminated with used oil, oil oxidation products, and fuel combustion products; and therefore oxidation of the oil takes place from the start. The actual value of an oil will be determined by its ability to counteract the contaminating materials by its action as a precipitant and the quantity and character of the oxidation products produced."

The authors discussed briefly the various acidic and insoluble oxidation products and, in somewhat more detail, their effect on characteristics of the oil. From a study of several examples of oils oxidized in engines, it was concluded that unless an oil is completely inhibited with an addition agent having a strong precipitating action on metallic accelerators the oil is certain to oxidize rapidly in service even if it has a high original resistance to oxidation as measured by the induction period. In connection with corrosion it was said to be particularly interesting to note that those oils having high iron content all show excessive oxidation as measured by the final viscosity.

The growing practice of adding organic halogen compounds to mineral oils for various purposes has created a need for methods of detecting them, determining their type, and identifying them. M. S. Agruss, G. W. Ayers, Jr., and H. Schindler, The Pure Oil Co., recognizing this need, have developed satisfactory methods which shorten the time required by a number of "well-known methods," and described the three procedures in a joint paper. Space is not available here to describe them.

New Uses for Petroleum By-Products Build Petroleum Chemical Industry

ABSTRACT

The growing importance of chemical compounds derived from various fractions of petroleum have been responsible for general investigation of the physical and chemical properties of those fractions which give promise of supplying useful materials for industry. Several speakers at the 100th meeting of the American Chemical Society discussed these expanding fields and presented new information on groups of hydrocarbons that have heretofore been included in waste products, or for which better uses have been found. In this group are included naphthenic acids, aromatic solvent naphthas, some of the high molecular weight fractions, cracked naphthas, and the unsaturated hydrocarbons, each of which are given special attention by various oil company laboratories.

"The expanding uses for naphthenic acids have made desirable a compilation of information regarding their occurrence, manufacture, composition, properties, analysis, and uses," it was explained by E. R. Littmann and J. R. M. Klotz, Stanco, Inc., in presenting data on these compounds at the 100th meeting of the American Chemical Society.

The present uses for naphthenic acids are based mainly on their relatively high acidity. "The unique properties of the metallic soaps of naphthenic acid account for the major uses of the acid at the present time. The alkali soaps are extremely soluble in water and 50% solutions of sodium naphthenate are now commercially available. These solutions flow freely and show no tendency to gel. Since commercial naphthenic acids have acid numbers of 200-300, their molecular weight is of the order of that of the fatty acids and the low viscosity of the aqueous alkali salt solutions is quite remarkable. In general, also, the naphthenic acids are somewhat stronger acids than those derived from fats and oils."

The alkali naphthenates have been proposed as both emulsifying and demulsifying agents. They have been used in emulsification of cresol for use as a disinfectant, and proposed for use in preparation of mineral oil emulsions, cutting oils, and asphalt emulsions. The demulsifying action is usually confined to water-in-oil type emulsions as encountered in petroleum refining. The use of various metallic naphthenates in lubricating compositions is usually confined to greases, high pressure and industrial lubricants. They have also found industrial application in preservatives, fungicides and insecticides, and in driers.

"The extraction of naphthenic acid from petroleum products is based upon the formation of sodium naphthenate by the neutralization of naphthenic acid with caustic soda or soda ash." The true naphthenic acids are believed to be normal constituents of all crude oils and occur to the extent of about .03-3.0%. In practice, it is recovered as sodium naphthenate from fractions in which it is normally concentrated during refining operations.

Several methods of recovery were outlined briefly from patent literature, all applying to still residues. Patent numbers of references are 1,694,280, 1,785,242, 1,804,451, 1,802,336, 1,986,775, 2,026,073, 2,056,913, 2,003,640, and 1,938,513. "Impurities associated with the acids are chiefly oil, phenols, basic nitrogen compounds and, to a minor extent, sulfur-containing compounds. While numerous methods of purification have been suggested, only those which combine relatively simple operations and low cost are of importance commercially. As a rule, simple distillation under reduced pressure yields an acid of sufficient purity for most purposes. Single distillations in some instances yield a product of 92-93% total acid content and a pale color. Although distillation improves color and acid number considerably, odor is less improved.

"The commercially available naphthenic acids are at present identified by origin and acid number. The lack of a more definite and scientific classification is probably due to the complexity of the mixtures of acids now known as naphthenic acid and to the absence of information correlating the properties of the acids from different sources." Chemically, the naphthenic acids have been classified as carboxylic acids of the formulas:

$$C_nH_{2n-2}COOH \text{ and } C_nH_{2n-4}COOH$$

The paper includes over 100 references to patent literature.

Aromatics for Paint Solvents

Aromatic solvent naphthas, several million gallons of which have been used as thinners, largely for automotive finishes, during the past 3½ years, can be produced from petroleum to augment the present supplies from coal tar light oils, it was concluded by W. J. Sweeny and E. H. McArdle, Standard Oil Development Co., in a joint paper on "Highly Aromatic Petroleum Solvent Naphthas."

"Furthermore, in the higher boiling ranges where coal tar distillate is deficient, petroleum sources can meet any presently conceivable demand. Already Aromatic Naphtha No. 3 (B. P. 175-210°C. or 347-410°F.) has become useful in the trend toward the higher baking temperatures demanded by automotive production schedules, and if still higher boiling aromatic naphthas are needed they can be easily made available. Also, should occasion demand, the petroleum industry could develop processes for the separation and commercial production of individual aromatics of any required degree of purity."

Virgin naphthas differ greatly in chemical composition, it was pointed out. Aromatics may be present in both the so-called paraffinic and naphthenic naphthas but they are more often present in greater amounts in the naphthas of the paraffinic type. Aromatic content may vary from 2-3% to 25-30%, particularly in the heavy naphtha range (100-200°C. B. P.). Analysis of a typical virgin naphtha at Pennsylvania State College showed a content of 0.7% benzene, 3.1% toluene, 5.1% ethylbenzene and xylenes, 4.9% C_9 aromatics and 3.4% of higher boiling aromatics, making a total of 17.2%. "By a more or less complicated series of processes, it is possible to manufacture from naphthas of this type a range of aromatic solvent naphthas which find wide application in the paint, varnish, and resin trade, and the automotive industry.

"A series of commercial thinners with evaporation rates matching those of conventional coal tar naphthas is at present manufactured from petroleum." Three finished aromatic naphthas, commonly referred by numbers 1, 2, and 3, were discussed. No. 1 has a boiling point range of 210-279°F., No. 2 boils at 270-353°F., and No. 3 at 347-412°F. The latter was said to be noteworthy as the first highly

aromatic naphtha of satisfactory boiling range and purity to be made available to the protective coatings industry in a boiling range above coal tar "hi-flash" naphtha.

In discussing the control tests for quality of the solvent naphthas, it was said that "mixed aniline point" has replaced "straight aniline point" as a solvency test for highly aromatic naphthas. The mixed aniline point is the critical solution temperature of a mixture of 10 ml. of anhydrous aniline, 5 ml. of thinner under test, and 5 ml. of any naphtha having a straight aniline point of 60°C. (140°F.)

"Proximate composition" of aromatic naphthas has received the attention of consumers of thinners, a number of whom have adopted the method recommended by the Philadelphia Paint and Varnish Production Club . . . The chief advantage of proximate analysis over the kauri and aniline point as measures of solvency lies in the fact that once the composition of a thinner, or pair of thinners, is known, a substitution or modification can be made in a paint formula and the desired result obtained on the first trial. The hydrocarbons of a given series, whether the aromatic, naphthenic or paraffinic, occurring in thinners of a given boiling range are approximately equal in solvency. In general, the solvency of an aromatic component is roughly double that of the corresponding naphthene and the solvency of the latter is roughly double that of the average paraffin. Consequently it becomes a simple matter to make a summation of solvency when desiring to replace one naphtha with another, or with a mixture of others.

High Molecular Weight Fractions

The problem of the chemical composition and structure of high molecular weight fractions of petroleum, particularly the proportion of 5- and 6-carbon membered rings, important for accurate determination of the ratio of paraffinic to naphthenic constituents, is being attacked in diverse ways, according to Gilbert E. Goheen, Sun Oil Co.

"Attempts to solve this problem are hindered by the fact that data on only a relatively small number of pure chemical compounds of these types are known. This is

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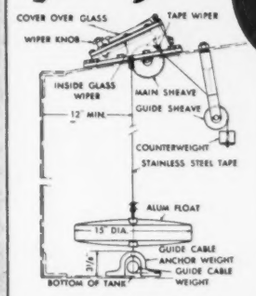

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especially true of the compounds containing 5-carbon rings. A search of the literature indicated that approximately 200 normal and branched paraffin hydrocarbons, 250 saturated cyclohexanes and polycyclohexanes of diverse types and 300 aromatics have been described to a more or less extent. But hardly more than 55 compounds of the saturated cyclopentane and poly cyclopentane type are known. Furthermore, about 40 of this number are monocyclic compounds of molecular weight too low to correspond to the gas oil or lubricating oil range."

"Excluding the monocyclopentanes, not more than 10 dicyclopentyl and bicyclopentyl derivatives are known . . . Practically nothing is known concerning hydrocarbons containing more than two cyclopentyl rings in the molecule . . . . However, petroleum fractions of the gas oil or lubricating oil range contain on the average two or more rings per molecule. Also naphthenic acids containing two rings per molecule are known and there is evidence that three or more rings are present in some fractions."

After showing it to be highly desirable that data on the physical properties of pure polycyclic 5-carbon ring hydrocarbons be obtained, Goheen said the first step in such a program was to establish the properties of the ring hydrocarbons themselves without the presence of an aliphatic side chain. A series of pure polycyclopentylcyclopentanes, therefore, were synthesized and their physical properties determined.

The compounds included bicyclopentyl ($C_{10}H_{18}$), 1,3-dicyclopentylcyclopentane ($C_{15}H_{26}$), 3,3'-dicyclopentylbicyclopentyl ($C_{20}H_{34}$), 1-cyclopentylcyclopentene-2 ($C_{10}H_{16}$), 3-(cyclopenten-2-yl)-biclopentyl ($C_{15}H_{24}$), and 1,3-dicyclopentylcyclopentene-2 ($C_{15}H_{24}$), ranging in molecular weight from 138.24 to 274.47, and in viscosity from 1.1 to11.1 centistokes at 130° F.

Cracked Naphthas

A rapid increase in demand for classes of compounds available in cracked naphthas has made it worth while to analyze a series of samples of representative refinery cracked and polymerized distillates at the Baytown Laboratories of Humble Oil and Refining Co. This work was done to determine primarily the unsaturate distribution and secondly the availability of certain desirable paraffins, naphthenes, and aromatics. A portion of this work was described by R. E. Tannich, B. W. Thomas, and A. R. Padgett.

Three samples were analyzed. They were designated as light thermal polymer naphtha, plant stabilized naphtha, and a composite of cracked naphthas. Results of this study showed that the concentration of unsaturates is greatest at split points between saturated compounds. This indicated a relatively even distribution of unsaturates throughout the boiling range with the saturated compounds concentrated at certain points.

The average concentration of unsaturates was found to be greatest in the low boiling fractions of any particular stock and gradually decreases as the boiling point increases. This was explained partially on the basis of formation of ring compounds instead of unsaturates in the higher boiling ranges and partially by the fact that the lower-boiling compounds in general are composed of the products of more complete decomposition than was realized in the production of the higher-boiling fractions.

The light thermal polymer naphtha contained a slightly larger percentage of unsaturates than the composite of cracked naphthas for a given boiling range, and the percentage of unsaturates in the composite was somewhat higher than in the plant stabilized naphtha. The higher percentage of unsaturates in the light thermal polymer naphtha was partially explained on the basis of the higher temperature at which it is produced, but it was said to be probable that the chief explanation is the fact that the saturates produced in the primary reaction do not appear in the debutanized thermal polymer naphtha but are lost in the discarded gas.

New Patents

Compiled by R. E. Burnham, patent and trade-mark attorney, 511 Eleventh Street, NW, Washington, D. C., from whom copies may be obtained at rate of 25c each. State number of patent and name of inventor when ordering.

August 13, 1940

Process for cracking hydrocarbon oils—B. P. Crittenden, assignor to Arkansas Fuel Oil Co. Filed Apr. 4, 1932. No. 2,210,901.

Oil reclaiming apparatus—B. R. Ells, Los Angeles, assignor to Langlois Bros. Filed Jan. 3, 1938. No. 2,210,906.

Dewaxing apparatus—W. B. Chenault, Wellsville, N. Y., assignor to Sinclair Refining Co. Filed Dec. 3, 1937. No. 2,211,098.

Catalytic dehydrogenation—C. M. Thacker, Toledo, assignor to Pure Oil Co. Filed Dec. 1, 1937. No. 2,211,219.

Method of producing motor fuels from hydrocarbon gases—C. R. Wagner, assignor to Pure Oil Co. Filed Jan. 25, 1939. No. 2,211,248.

Method of decolorizing (and refining) oil—E. C. Bierce, Pasadena, Cal. Filed Oct. 3, 1938. No. 2,211,489.

Combination polymerization and alkylation of hydrocarbons—A. R. Goldsby, and Claude W. Watson, assignors to Texas Co. Filed Apr. 21, 1938. No. 2,211,747.

Motor fuel—David Lipkin, Berkeley, Cal., assignor to Atlantic Refining Co. Filed Oct. 20, 1936. No. 2,210,942.

Lubricating oil composition—H. E. Ries, Jr., Chicago, assignor to Sinclair Refining Co. Filed Sept. 22, 1937. No. 2,211,163.

Gasoline antioxidant—J. W. Teter, Chicago, assignor to Sinclair Refining Co. Filed Aug. 17, 1937. No. 2,211,180.

Treatment of catalysts—Vladimir Ipatieff and Louis Schmerling, assignors to Universal Oil Products Co. Filed Oct. 31, 1938. No. 2,211,207.

Manufacture of catalysts—Vladimir Ipatieff and B. H. Corson, assignors to Universal Oil Products Co. Filed Oct. 31, 1938. No. 2,211,208.

Method for reactivating catalysts—L. S. Kassel, assignor to Universal Oil Products Co. Filed Oct. 12, 1939. No. 2,211,211.

Lubricant and method of preparing same—L. M. Henderson, Winnetka, Ill., assignor to Pure Oil Co. Filed Dec. 19, 1935. No. 2,211,231.

Soluble cutting oil and method of preparing same—P. T. Anderson, and H. L. Moir, assignors to Pure Oil Co. Filed July 17, 1936. No. 2,211,250.

Lubricant and method of preparing same—W. A. Whittier, and N. D. Williams and H. L. Moir, assignors to Pure Oil Co. Filed Dec. 19, 1935. No. 2,211,306.

Treatment of motor fuels with aromatic esters—F. R. Bean, assignor to Eastman Kodak Co. Filed July 1, 1938. No. 2,211,313.

Lubricant—E. M. Steffen, Berlin, Germany, assignor of three-fourths to Tide Water Associated Oil Co. Filed Sept. 15, 1936. No. 2,211,442.

Lubricating oil and lubrication therewith—P. G. Colin, and A. W. Lewis, assignor to Tide Water Associated Oil Co. Filed Sept. 25, 1937. No. 2,211,558.

Lubricating composition—B. T. Brooks, New York, assignor to American Cyanamid Co. Filed Mar. 18, 1937. No. 2,211,687.

Motor fuel—A. N. Sachanen and A. W. Francis, assignors to Socony-Vacuum Oil Co. Filed Feb. 10, 1939. No. 2,211,732.

* * *

August 20, 1940

Oil cracking and polymerizing heater—L. J. McCarthy, Lakewood, Ohio. Filed Feb. 10, 1937. No. 2,211,903.

Treating of lubricating oils—C. E. Andrews, and M. R. Fenske, assignors to Rohm & Haas Co. Filed June 3, 1938. No. 2,211,944.

Process for hydrocarbon oil conversion—J. G. Alther, assignor to Universal Oil Products Co. Filed Nov. 30, 1936. No. 2,211,999.

Treatment of hydrocarbons—Vasili Komarewsky, assignor to Universal Oil Products Co. Filed Dec. 31, 1936. No. 2,212,026.

Conversion of hydrocarbon oils—L. C. Huff, assignor to Universal Oil Products Co. Filed Sept. 29, 1937. No. 2,212,023.

Heating of fluids—L. A. Mekler, assignor to Universal Oil Products Co. Filed Apr. 14, 1938. No. 2,212,030.

Catalytic dehydrogenation of hydrocarbons—J. C. Morrell and A. V. Grosse, assignors to Universal Oil Products Co. Filed Apr. 30, 1938. No. 2,212,034.

Conversion of hydrocarbons—J. C. Morrell and A. V. Grosse, assignors to Universal Oil Products Co. Filed Apr. 30, 1938. No. 2,212,035.

Apparatus for refining or catalytic treatment—Robert Pyzel, assignor to Universal Oil Products Co. Filed Dec. 31, 1938. No. 2,212,043.

Processes for removing acid components from hydrocarbon distillates—D. L. Yabroff, assignor to Shell Development Co. Filed Feb. 7, 1939. Nos. 2,212,105, 2,212,106, and 2,212,107.

Recovery of liquid hydrocarbons from distillate wells—G. S. Bays, assignor to Stanolind Oil & Gas Co. Filed Sept. 29, 1938. No. 2,212,143.

Oil composition—B. W. Story, and E. W. Fuller, Woodbury, N. J., assignors to Socony-Vacuum Co. Filed Mar. 2, 1937. No. 2,211,798.

Gear lubricant and method of making it—L. G. Brunstrum, G. W. Flint, F. H. MacLaren, and Wade Adams, assignors to Standard Oil Co. (Ind.) Filed May 17, 1937. No. 2,211,921.

Grease—F. W. Sullivan, Jr., assignor to Standard Oil Co. (Ind.) Filed Nov. 18, 1938. No. 2,211,941.

Compounded mineral oil—E. W. Gardiner and G. H. Denison, Jr., assignors to Standard Oil Co. (Cal.) Filed Oct. 4, 1938. No. 2,211,972.

Material for treatment of fuel oil—E. F. Quirke, Brooklyn. Filed Nov. 14, 1938. No. 2,211,987.

Preparation of organic sulfur compounds—B. H. Shoemaker and H. R. Batchelder, assignors to Standard Oil Co. (Ind.) Filed Aug. 28, 1937. No. 2,211,990.

Manufacture of naphthalene—A. V. Grosse and W. J. Mattox, assignors to Universal Oil Products Co. Filed June 28, 1937. No. 2,212,018.

Lubricants—W. B. Hendrey, assignor to Texas Co. Filed Apr. 1, 1937. Nos. 2,212,020 and 2,212,021.

Conversion of aliphatic hydrocarbons to cyclic hydrocarbons—J. F. Clausen, Amsterdam, Netherlands, assignor to Shell Development Co. Filed Nov. 26, 1938. No. 2,212,112.

Cut in Oklahoma's Production May be Result of 'Challenge'

N. P. N. News Bureau

TULSA, Sept. 30.—Challenged by Arkansas and Louisiana to curtail crude production, and warned that federal regulation of oil was imminent unless corrective steps were taken, Oklahoma Corporation Commission early this week is expected to issue an order that will bring actual October production 8000 to 10,000 bbls. below September output and about 3500 bbls. below the Bureau of Mines' demand estimate.

The order is expected to set state's production at 390,000 bbls. daily, same as the September order. But downward revision in percentage of production allowed in flush fields is expected to bring actual production below the 400,000-bbl. mark. Oklahoma has been overproducing its September allowable by almost 20,000 bbls. at times.

The challenge by Arkansas and Louisiana—non members of the Interstate Oil Compact Commission—was a bitter pill for the Oklahoma Corporation Commission. It was the compact that recommended at its late August meeting that production be curtailed 5% below the Bureau of Mines' demand forecast in the interest of correcting weak spots in the over-all picture. The recommendations by the compact were rejected in September by all southwestern states except New Mexico, which curtailed allowed output about 4.75%.

Established Precedent

Arkansas and Louisiana set up the precedent by curtailing October allowed production approximately 5250 bbls. below their September orders.

It had been pointed out to producers and purchasers just prior to the Oklahoma proration hearing that the compact and each of its member states would "lose face" with non-compacting states if production were not curtailed.

Louisiana Legislature has vested in its governor the power to join the compact and Arkansas is being sought as a member state. Along this line, Compact Secretary Charles Orr had this to say to producers and purchasers:

"If we, the compacting states, do not agree upon our own program and abide by our own decisions and agreements, how can we expect the non-compacting states to do anything? That's just what the other states are asking me."

Federal Control Threats

Threats of federal control of the oil industry came from several sources. Judge J. C. Hunter, Texas' representative on the compact who recently returned from a trip to Washington, again stressed the need of meeting the industry's problems or having those problems taken over by Washington.

Judge Hunter speculated on the amount of time regulatory states might be given in getting their house in order "before someone moves in and tells us what to do." Optimistic that the industry had some time left to prove its ability to operate efficiently, Judge Hunter warned that time was limited and a spirit of "give and take" must prevail between producing states before a constructive program of conservation can be successful.

Judge Hunter has crossed the U. S., visiting producers and purchasers in an effort to obtain the over-all picture of oil and to determine the actual market demand for crude. His remarks to producers and purchasers at a pre-proration hearing conference were based on his findings from this trek.

Compact's Cut Urged

Judge Hunter told NATIONAL PETROLEUM NEWS that conditions existing late last August when the compact suggested the 5% cut below the Bureau's demand forecast, had not changed. The survey, he said, indicates too much oil is being produced in comparison with actual demand, and that he recognized there were localized conditions where increased production might be warranted, "but if the producing states follow the compact's recommendations for a 5% cut, the pressing situation facing the industry would be relieved considerably."

While in Washington, Judge Hunter told NPN he was unable to obtain any authentic information regarding conferences between Interior Secretary Ickes and several other prominent oil men. These conferences at Washington are said to have been called to discuss some form of federal "supervision" of the oil industry.

State Senator Anglin, active in compact work in Oklahoma, voiced a warning against federal control and stated lack of confidence and selfishness now apparent between producing states must be eliminated or federal control is inevitable.

This feeling of caution was apparent at the Kansas Corporation Commission proration hearing at El Dorado earlier last week. After receiving purchase nominations for October totaling 182,300 bbls. daily, the commission adjourned to give further consideration to its October allowable order.

The October nominations are subject to correction, it was said, since some estimates were used and 1 or 2 purchasers failed to report. The 182,300-bbl. figure reported by Commission Chairman Schoeppel is 3600 bbls. above the Bureau of Mines' demand forecast and 7700 bbls. below Kansas' August allowable order.

In Mississippi, where the oil and gas board has no jurisdiction over crude output, the "production race" among Tinsley field operators was reported brought to a close last week.

The "race", started several weeks ago, culminated in a total production of 25,000 bbls. daily from the field, 20,000 bbls. of which was going into storage on the Gulf coast.

Production from the approximately 81 Tinsley field wells was curtailed last week from 25,000 bbls. daily to 8000 bbls., according to H. M. Morse of the oil and gas board.

Lack of market, increasing storage and decreased bottom hole pressure were believed to have been factors in the curtailment.

'Failure' of States to Cut Allowables Considered by Producers' Committee

FORT WORTH, Sept. 30.—Independent Petroleum Assn. of America's Committee of 29, which was delegated the job of wrestling with the current and prospective problems of the independent producer, is said to have given serious consideration to the failure of states which are members of the Interstate Oil Compact Commission to act on the compact's recommendation for reduced production.

The committee met here last week for further discussion of the report it expects to make to the I.P.A.A.

The committee is divided into several sub-committees and the one dealing with the compact is reported to have considered the present powers vested in the compact by state and national laws and the possible methods of bolstering that authority. The I.P.A.A. recently advocated curtailed production below the Bureau of Mines' demand estimate for crude.

Other sub-committees studied oil imports and the record taken at the Temporary National Economic Committee hearings at Washington, it was said.

Charles F. Roeser, Fort Worth producer and past president of I.P.A.A., who has been reported conferring with Interior Secretary Ickes and several other prominent oil men recently, was present at the committee meeting. He is reliably reported to have resisted all efforts to have him speak about the subject matter of the conferences with Secretary Ickes.

W. A. Moncrief of Fort Worth is chairman of the general committee.

Fort Worth-Oklahoma City Line Is More Than Half Completed

DALLAS, Tex., Sept. 30.—Approximately 140 miles of Magnolia Pet. Co.'s 4.5-inch welded gasoline line from its Fort Worth refinery to Oklahoma City had been laid by last week, according to reports today.

The pipeline is being laid by three crews, operating from Gainesville, Tex. and Oklahoma City toward Fort Worth and from the Red River. Two of the crews had completed the laying of 47.5 miles of lines and the other 45 miles, it is said.

Work is more than one-half completed, since the line is slightly more than 200 miles long.

Sinclair is Ready For Any 'Trouble' Stockholders Told

N. P. N. News Bureau

NEW YORK, Sept. 30.—"Whatever the future may be, due to gasoline wars here, the war abroad, or any other troubles that may arise, we intend to be in a position, financially and otherwise, to cope with any competition, any competitors or conditions with which we may be faced," H. F. Sinclair, board chairman of Consolidated Oil Corp., told stockholders at a meeting Sept. 25.

Consolidated declared 12½c dividend, instead of 20c rate paid since February, 1937. Low gasoline prices and the uncertainty of "future conditions" in the industry were given as explanation of the reduced dividend.

Public Relations Commenced By West Coast Oil Industry

N. P. N. News Bureau

LOS ANGELES, Sept. 26.—Realizing the need for better relations between the petroleum industry and the public, the first in a series of advertisements is appearing in 900 newspapers on the Pacific Coast next week, published in behalf of the Pacific Coast petroleum industry as part of a public relations program which was inaugurated last year.

Clarence Beesemyer, vice-president and general manager of Gilmore Oil Co., and chairman of the committee directing the public relations project, says:

"The petroleum industry's great crime has been industrial modesty. Blushingly whispering compliments to itself, it has kept the public in ignorance of its activities, aims and accomplishments. The chief difficulty with our public relations is misconception, caused by lack of knowledge.

Public To Hear Facts

"As a case in point, petroleum has a thrilling story to tell of its part in national defense, but most of that story has been hidden from the public between the covers of industry trade journals. If we want the people to think well of us, we must give them something to think about. It's time we told them our story."

Ford Sammis, former assistant to the president of Lord & Thomas, says that this project is indicative of a new trend toward industry localizing its public relations.

This campaign looks toward better relations between the oil industry, its employes and its customers. Reports state that plans are underway to start active operation of the program under an enlarged committee representative of all phases on the industry.

"How to Avoid War" is the title of the first newspaper advertisement, which, in part states: "Aggressor nations attack only when they think they can win. Here are some facts that should discourage such ambitions toward the United States."

The advertisement then states the advantages of this country's aviation gasoline production, its oil reserves, synthetic rubber and toluene by-products and California's voluntary curtailment program.

U.S. Markets Not Disturbed By Imports 'Strippers' Told

N. P. N. News Bureau

TULSA, Sept. 23.—Study by the U. S. State Department of the crude imports situation and its effect on U. S. markets, indicates that importations are not a disturbing factor, State Department wrote the Oklahoma Stripper Well Assn, in response to its complaint that imports would be detrimental to the U. S. oil industry and that it was unfair to curtail domestic production and allow increased imports of crude.

"The percentage of U. S. demand supplied in recent years by imports has apparently been satisfactory to the bulk of domestic producers and has not seemed to be a disturbing factor in the industry," the State Department's letter said, adding "on the contrary, imported petroleum apparently has operated as a stabilizing factor with respect to prices and stocks in the Atlantic Coast market."

Explaining this contention, the State Department's reply continued: "The petroleum industry has been affected many times by the production of crude petroleum in excess of current demand. In addition to increased production of crude petroleum, an unusual over-production of gasoline, the principal and most profitable source of income to the industry, resulted from the increased output of fuel oil to meet the heavy demand on the Atlantic coast occasioned by the past severe winter.

"This disturbing situation was relieved to some extent by the increased imports in the early months of this year, of heavy fuel, and of crude petroleum yielding a larger percentage of fuel oil and a relatively small percentage of gasoline. This has made it possible to supply fuel oil demand on the East coast with a somewhat less excess of gasoline than otherwise would be the case."

It was pointed out to the stripper well owners that total imports have recently supplied about 10% of the Atlantic coast market for heavy fuel, but that due to emergency demand free and taxable imports the first quarter of 1940 increased somewhat. Peak importations were reached the end of March, the letter said, diminishing in April, May and June.

Several preliminary discussions of the State Department's reply have been reported among stripper well owners. A meeting of the Oklahoma Stripper Well Association's executive committee is expected to be called soon to take official action on the letter. A reply has been indicated.

LOS ANGELES, Sept. 27.—Standard Oil Co. of California today reduced its San Pedro base price of Bunker C fuel oil for ships' bunkers or in deep tank lots to $0.75 per bbl. Union Oil Co. met the cut. This change, which involved a reduction of 15c per bbl. from previous figures at other Pacific Coast ports, was believed to be in anticipation of the opening of the fuel oil contract season, Oct. 1.

Gulf Aviation 'Gas' Down 80,763 Barrels

HOUSTON, Sept. 30.—Aviation gasoline stocks at 10 Gulf Coast Refiners Assn. member plants were down 80,763 bbls. Sept. 15, compared with reports from nine G.C.R.A. refiners Aug. 31, according to reports from G.C.R.A. today. In this same period, there was an increase of 38,562 bbls. in motor fuel inventories.

Stocks of all gasolines held by 10 members Sept. 15 totaled 2,994,303 bbls., compared with 3,034,305 bbls. held by nine members Aug. 31.

Refinery runs by all Gulf Coast refiners, including those of large integrated companies, represented 86 to 89% of capacity, the report said.

Kerosine stocks, Sept. 15, at the 10 reporting refineries totaled 217,278 bbls.; diesel gas oil, 383,437 bbls.; diesel fuel oil, 87,752 bbls.; all other types of gas oil, 395,146 bbls.; No. 5, 170,917 bbls.; and Bunker C, 283,309 bbls.

Michigan API Group Hears Miller Speak On Echometer Tests

MT. PLEASANT, Mich., Sept. 26.—More than 90 members of the Michigan chapter of the American Petroleum Institute recently heard Lee Miller, petroleum engineer of Michigan Department of Conservation, talk on "Echometer Tests in Michigan."

Mr. Miller explained the operating principles of the echometer and its value to the producer. A casing head used in making such tests was shown to the group as well as numerous charts showing readings of tests made throughout the state.

Vocation education was discussed by F. W. Dolton, chief of Trade and Industrial Division, Board of Control for Vocational Education, and Ed Melin, head of Vocational Education Department of Mt. Pleasant High School. Mr. Melin offered the co-operation of the local Board of Education in organizing classes for oil men. This offer was accepted and Chairman Marshall R. Joy was instructed to appoint a committee to organize the classes.

The Michigan chapter, organized only a few months ago, now has a membership of 133, with applications still coming in, reports E. Allan Morrow, secretary.

California Sets Quota For October Production

N. P. N. News Bureau

LOS ANGELES, Sept. 28.—California oil production quota for October was set at 571,000 barrels daily by the conservation committee of California oil producers. This is the same figure as for September.

To make room for anticipated additional oil production from new wells, the committee reduced the top allowable for any one well by 3 bbls. per day, bringing the maximum output to 153 bbls. per day. The power factor for intermediate producers was also reduced.

Oil Exports Drop But Imports Gain in August

N. P. N. News Bureau

WASHINGTON, Sept. 23.—Preliminary figures issued by the Commerce Department for August show declining exports and mounting imports of petroleum and its products. Details follow:

	JULY		EIGHT MONTHS	
EXPORTS	**1939**	**1940**	**1939**	**1940**
"Gas" and other Motor Fuel (1000 bbls.)	3,422	1,497	25,179	13,062
($1000)	8,612	4,133	62,429	42,316
Lubricating oil (1000 bbls.)	1,122	999	7,350	8,420
($1000)	7,624	7,525	51,895	74,503
Crude petroleum (1000 bbls.)	5,969	8,621	48,214	40,706
($1000)	7,383	5,207	61,973	47,862
Paraffin wax ($1000)	484	262	4,797	7,937
Gas and fuel oil (1000 bbls.)	4,483	2,356	31,602	21,909
($1000)	5,159	2,878	37,339	25,988
IMPORTS				
Crude petroleum (1000 bbls.)	2,942	4,150	22,280	26,349
($1000)	1,964	3,113	15,186	19,568
Gas oil and fuel oil* ($1000)	1,268	2,357	8,025	17,911

*Partly oil used for refueling vessels and for refining and export.

Oil Burner Market Expands

Smaller Homes Can Now Use Oil Burners Economically; Replacement Market Grows with More Efficient Units

RECENT improvements in oil burners, in oils and in oil company services, have made oil heating more attractive to home owners, who in turn have created an enlarged market.

According to well-informed men in this industry, best sales opportunities for companies in the oil heating field during the next few years, are:

1—Sales of automatic oil heat to small homes, in the $2500 to $5000 class.

2—Sales of replacement conversion burners to homes and buildings which installed oil burners arcund 10 years ago, and which are now obsolete and costly to opperate, compared with modern burners. Oil burners of today are rated at from 15 to 20% improved efficiency over those 10 years old.

3—Sales of complete heating units, furnace, or boiler, and burner, to new homes principally, but to some extent to replace present heating systems. These complete units are now offered at a price to compete with heating units for other fuels.

This is a summary of the opinion of many oil burner manufacturers and oil companies with experience in the heating field, as gathered through a survey made this past summer by NATIONAL PETROLEUM NEWS. With the biggest oil demand asked for heating homes and other buildings for any winter to date, these authorities, however, are expecting larger use of heating oil in the years to come.

Estimates of the number of domestic oil burners that will be in use in furnaces and boilers this coming winter, excluding the smaller space heaters used for heating single rooms, vary from 2,100,000 to 2,400,000. The statistical department of the American Petroleum Institute estimates an average of 2,150,000 burners will be in service this winter, which is an increase of about 13% from the average number in operation in the 1939-40 winter.

Should the coming winter prove to be one of normal temperatures (an average of the past 10 years) demand for the light fuel oils for heating is placed by this same authority at 108,000,000 bbls., about 9% larger than last year. If this coming winter is as cold as the last one, total demand for these oils may amount to 112,000,000 bbls.

Looking beyond this coming winter, many builders and architects, as well as burner manufacturers, believe the greatest use of oil for heating homes, will come in the next few years, through the installation of burners in homes costing $2500 to $5000 to build. Heretofore, it has been assumed that the man who owned or rented a home in this class did not have a large enough income to be a prospect for automatic oil heat.

Shown here is an oil burning space heater with adjustable shutters on front and sides which can be adjusted to direct heat outward or downward to warm the floor

Several instances are reported where oil furnaces were installed in homes selling from $3500 to $5000, and the cost of the burner and its operation were well within the amount the home owner could afford. This indicates that it will not be a great step to selling oil heat for this class of home already built, if consumer prices for light fuel oils stay at the same relative level with other fuels.

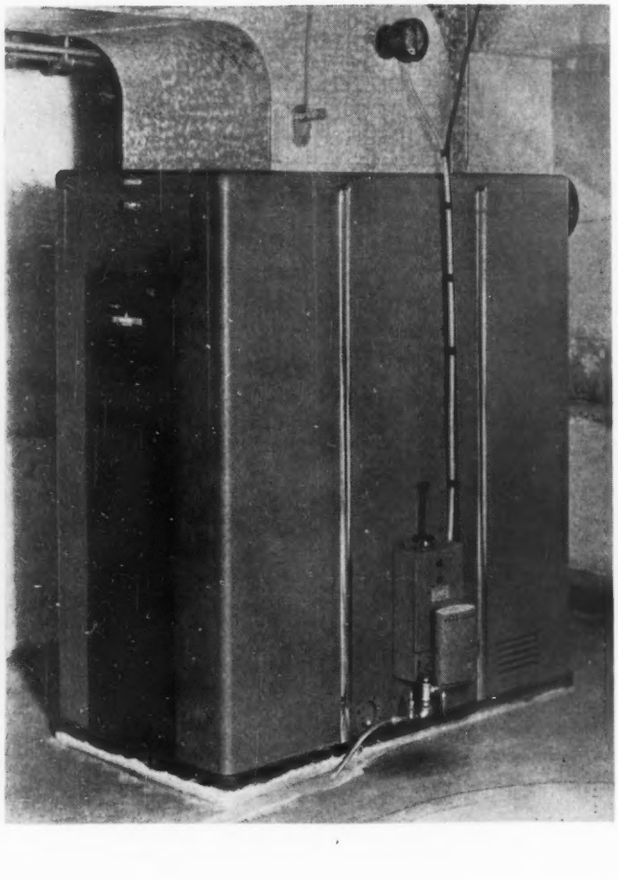
One burner manufacturer has data for the past 2 winters on the cost of oil heating ten 5-room residences in Knoxville, Tenn., which show savings over the cost of heating similar dwellings in the same city with coal at $5 a ton.

These dwellings were sold at $5000 complete with lot, this price also covering finance charges and insurance. The builder guaranteed to pay all fuel bills over $57.50 for the season. Oil heating plants were installed at a cost of $450 complete and it was estimated they would deliver 70% of the B.T.U. content of the oil to the rooms to be heated, while coal-fired plants, even with stokers, would not transfer more than 40% of the B.T.U. content.

THE first winter, 8 of the oil heated homes, occupied throughout the season, cost their owners a total of $242.55 for fuel to March 1, while 9 homes in Knoxville using coal paid $278. The second winter, to March 1, heating cost in the oil-heated homes was an average of 3.26c a sq. ft., and for coal it was an average of 3.61c.

In a new building construction in Arlington, Va., in which over 500 homes will be built, costing from $3550 to $4890 each, oil burners will be installed throughout, another burner manufacturer reports. Estimates of the cost of heating with various fuels were made before oil was selected.

Various data at hand show the extent of the market for oil heating if



This is an oil burning air conditioning furnace installed in an uninsulated Iowa frame house, 41 by 27 feet and 1½ stories high. Cost of heating in 1939-40 season was $75.26, according to owner and confirmed by oil supplier

burners can be sold to homes costing from $2500 to $5000. A recent study by the "Chicago Tribune" showed that 60% of homes in that city were in the $4000 to $5000 price class and that 73% were under $6000 in building cost.

Figures of the Federal Housing Administration showed a house-and-land value of less than $8000 in 91% of homes financed by this government agency. In more than 42% of the FHA applications, the cost of the building was less than $5000.

ANOTHER authority says that new homes in the $2000 to $8000 class built in 1939 totaled about 400,000 over the country, and it is estimated from 450,000 to 600,000 homes in this class will be built this year. Practically all these new homes are regarded as prospects for complete oil heating units.

One advantage found for oil heat in low cost new homes is that the cost of a basement can be avoided and the oil furnace installed in a heating or utility room on the ground floor. If a supply of coal is necessary, a basement is the most convenient way of handling this fuel.

Already, the use of oil is widespread in heating small homes costing up to $2500, with the small natural draft type burners which have been sold for converting coal stoves and kitchen ranges to oil. Usually these heaters burn an average of 0.5 gal. of fuel an hour. They use kerosine or a similar product known in the East as range oil.

The oil market for heating homes costing $5000 and over, has been receiving the attention of builders and heating engineers in past years. The majority of the mechanical type oil burners used in these larger homes are of the high pressure atomizing type. A typical design comprises a motor turning an impeller fan and a gear type oil pump. Oil under high pressure is atomized by discharge from an orifice. Fan air is admitted, and the mixture is ignited by electric spark. Combustion takes place in a chamber within the heating plant and the burner is mounted outside. The firing rate ranges from 1.25 to 3 gals. per hour and is dependent on the nozzle orifice size.

For small homes, it has been necessary to design nozzles providing a smaller orifice size which would work efficiently and these gun type burners have been introduced by several manufacturers within the past year, for small dwellings. For such dwellings the wall flame type of burner is found efficient, considering operating cost and maintenance as well as first cost.

This type of burner consists of a flat hearth sealing off the boiler ashpit, with a central opening, through which a motor-driven, vertical shaft projects. Oil and air are distributed radially by centrifugal force, with combustion taking place close to the boiler wall. This type of burner is quiet in operation and is said to be efficient at from 0.5 gal. an hour upward.

For the small home oil heating market, one oil company in the Middle West has recently taken on a package unit consisting of a mechanical draft, pot type burner, furnace and air conditioning unit which sells for $275, and is in the cost range of a modern coal furnace for this class of dwelling. It operates on No. 1 grade oil. While this company believes its sales will be mostly in new homes of the small cottage type, sales are expected in homes already built, provided they are well insulated.

As important in the sale of oil burners today for all types of homes as the great improvement in their efficiency and appearance, is the fact their prices have declined steadily in the past 10 years and more. In 1929, the average conversion burner installation cost about $700, while in 1939 the cost was around $270. The average price of boiler burner units has dropped from over $900 in 1935 to around $500 in 1939; of furnace burner units from nearly $800 in 1935 to about $520 in 1939.

OF the present cost of a conversion oil burner, the wholesale cost is about $75, installation plus a year's service is around $72 average, sales commission around $25, leaving a gross margin of about $57. The cost of the present conversion burners and their fuel capacities was given to NPN by some burner manufacturers as follows:

One eastern manufacturer said the lowest cost of his burner was $189.50, and that, for a house of normal construction with no insulation and approximately 10 to 12 years old, this burner would heat 10 average size rooms, using about 1800 gals. a season. Rated fuel capacity of the burner is 1.35 gals. an hour.

A middle-west manufacturer said his lowest price conversion burner for small homes was $225, for a standard installation with a 265-gal. tank, the burner heating a 9-room house with 1600 gals. of oil last winter at a cost of $120. Another manufacturer said his lowest cost burner was $75 to the dealer for burner and controls only, or $225 completely installed with a 250-gal. tank, this burner heating a 6-room house efficiently.

Another manufacturer said a modern conversion burner should heat a home well insulated and fitted with storm windows at a cost of $12 a room, with oil at 7c a gal. An eastern manufacturer said his burner, costing $190 with a 275-gal. tank, would heat up to a 16-room house, each room requiring 40 sq. ft. direct steam radiation.

"The price on our ordinary gun burner, ranges from $175 to $250, depending on local requirements, such as low water cutoff, fire valves, fire-

Lighting home fires

Refiners are preparing for winter and are stepping up their recovery of fuels at the expense of gasoline yields—CHICAGO JOURNAL OF COMMERCE, Sept. 6, 1940

That's good judgment Millions of families will soon be lighting home fires —oil fires Signs point to record demand this coming winter

Now is the time to get ready for it— and to reduce gasoline stocks

Next summer it will be the other way around—the call will be for gasoline

With Dubbscracking, the foresighted refiner can follow the market around the calendar, making the biggest yield of wanted products when they are wanted

And at lowest cost

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

How Home Owner Can Save on Oil Bill By Lowering Night Temperatures

Shell Oil Co., Inc., uses this table to convince its heating oil customers of the savings in oil consumption they can make by reducing the temperature for definite periods at night.

The figures given were calculated for an inside daytime temperature of 70° F. and an average outside temperature for the heating season of 35° F.

Lowered Night Temp. ° F.	Per Cent Savings in Fuel Oil When Thermostat Setting is Lowered at Night for a Period of 4 Hrs.	8 Hrs.	12 Hrs.	16 Hrs.
70	0	0	0	0
65	2½ %	5%	7½ %	9½ %
60	5%	9½ %	14½ %	19½ %
55	7½ %	14½ %	21½ %	28½ %
50	9½ %	19½ %	28½ %	38½ %

proofing, etc.," said one burner company. "Figuring an average of 50 sq. ft. of radiation to a room, this would take care of a 12-room house. Capacity of the burner varies from 1 to 2.5 gals. an hour."

The great majority of the oil burners installed today are still of the conversion type, for installation in existing furnaces. Until the past few years, complete heating units, either boiler burner units or furnace burner units, were not obtainable. Now, however, a wide selection of complete units in various sizes are available for steam, hot water and direct firing. They are compact in size, modern in appearance and are sold as complete units, calling for a minimum of work in installing them.

SOME burners applied to steam, vapor or hot water plants include a hot water heater and provide means for heating water for household use in the summer, when the boiler proper is not operated. Some of the complete units provide air filters and can be operated in the summer for air conditioning, at very little expense.

Many oil company executives and burner manufacturers see a definite trend to the sale of complete units, particularly with the adaptation of oil heat to homes in the $5000 class and under. At present, however, the sales of complete heating units are reported to NPN by individual manufacturers as varying from only 10 to 20% of their total sales.

In general, at the end of 1939, sales of complete units and replacement sales were a little under 30%, and sales of burners for conversion of furnaces from other types of heat were 70%. A survey at that time showed, of the total oil burner installations, about 90% were conversion burners, the remainder being complete boiler burner or furnace burner units. The gain in conversion burner installations in 1939 from 1938, however, was around 11%, while gain in boiler burner installations was 25% and in furnace burner units over 40%.

While the largest sales channels for oil burners are still for converting the existing furnace or boiler from some other type of fuel to oil, and will remain so for some years to come, burner manufacturers believe that replacement sales of old conversion burners will form a growing part of the oil burner business.

The improved efficiency of today's burners and their more compact and neat appearance, as well as their quietness in operation, makes a burner obsolete, even though installed 10 years ago, it is said. Some types of burners can be modernized for a small part of their original cost, and will then operate at enough lower fuel costs to soon pay for modernizing the burner.

"Well designed, present day burners can operate at a CO_2 (Carbon dioxide) content of 10% and above," said one burner manufacturer. "Ten years ago, the average pressure atomizing oil burner operated at 6% CO_2. Therefore, a change in burners in the same boiler would probably show an increased efficiency of not less than 12%. In my opinion, the replacement of the total equipment, including boiler or furnace, would show an increased efficiency of 20 to 25%."

A modern oil burner and new combustion chamber will save 15% more in fuel cost than from a burner installed 10 years ago, said a burner company. Another said on this subject:

"We have reports from our dealers who have during the past 4 seasons, made replacements of old type oil burners upon a basis of guaranteeing the owner a saving of 20% in fuel, and in every case the 20% saving by the replacement has been realized.

"The modern oil burner is almost entirely service free as compared to a probable average of $15 per season spent for service in the older types. The most profitable selling outlet today to the oil burner dealers is that of replacements, and burners sold as replacements can usually be made with only 4 or 5 hours labor due to the fact the home is already wired and the supply tank and piping already in position.

"Furthermore, this market is not so highly competitive, because the home owner who bought the original equipment is laboring under the impression that he purchased an oil burner instead of an oil burner installation, whereas as a matter of fact the cost of the accessories such as wiring and fuel tank was originally the major portion of his investment."

The fact that this installation work was already done, together with the lower cost of the burner itself, as compared with 10 years ago, made a replacement oil burner an attractive proposition to home owners with old burners, this company said.

Another burner manufacturer said: "The burner of today has more efficient combustion, is more simplified in design and uses a 60% smaller motor than one of even 10 years ago."

The insistence by many banks and home financing agencies of guarantees of the efficiency of the heating systems in dwellings being built or modernized, is helping to educate the public on the subject of home heating and makes it easier for the oil burner salesman to secure an audience, some of the burner people say. The leading oil companies marketing fuel oils are helping in this education by training their salesmen to show home owners how to secure the most efficient operation of their oil burner furnaces.

THE Federal Housing Administration, for example, which is helping to finance the construction and modernization of hundreds of thousands of homes now officially recognizes the importance of the amount of carbon dioxide in flue gases as an important index of the quality of the combustion performance of an oil burner. It now requires a showing of at least 8% of carbon dioxide in the flue gas, on all domestic burner installations financed by this government agency. Carbon dioxide per cent is an index to preventable fuel losses; 8% means there is a preventable fuel loss of 10%, due to excess air employed in burning the oil. Smaller per cents of carbon dioxide mean the heating system is allowing more than 10% of preventable fuel loss.

The FHA at Washington told NPN its experience with oil burners in FHA financed homes had been that the equipment was good in most cases, and when oil heating costs were found excessive, it was due to these 5 faults in installation.

1—Lack of correct relationship between sizes of burners and boilers, resulting in high chimney losses.

2—Poor chimneys.

3—Absence of a draft regulator to permit uniform combustion under varying weather conditions.

4—Poorly adjusted air mixtures.

5 — Unsatisfactory combustion chamber.

Shell Oil Co. Inc. supplies home own-

STARTED FROM SCRATCH IN 1933

Now Services 120 Outlets!

North Carolina distributor explains his phenomenal expansion

"Our 120 outlets are located in fifteen counties," reports Mr. C. M. Barringer, secretary-treasurer of the Superior Petroleum and Fuel Company of Newton, North Carolina. "We've come a long way since we started with Cities Service in 1933.

"Dealer meetings conducted by Cities Service have done a lot to help us. Cities Service officials and salesmen have given us the utmost cooperation right from the start. And such inducements as the Touring Bureau, Road Maps and the Grantland Rice Football Guides definitely have proved that Cities Service is the right service to build better business."

IT PAYS YOU TO SELL CITIES SERVICE PRODUCTS

And Cities Service Helps You Do The Selling!

All this support is yours when you sign with Cities Service:

Radio—The Cities Service Concert, radio's oldest program, thrills millions of listeners every Friday night. Lucille Manners, Frank Black, Ross Graham and Ford Bond help you sell Cities Service products.

Magazines—Cities Service's 1940 theme "an extra year of youth for your car" reaches additional millions of readers in the Saturday Evening Post and other well-known publications.

SPECIALTY PRODUCTS THAT BRING IN EXTRA FALL PROFITS FOR CITIES SERVICE DEALERS

CISCO-SOLVENT—a new and sensational product compounded from an exclusive formula designed to treat an engine internally to remove sludge, gum, varnish, dirt and carbon.

KOLDPRUF—an exclusive petroleum anti-freeze compounded for particular motorists who want safe, economical, and effective cold weather protection.

Folders, Matches, Maps—and other merchandising material. Each especially designed to do a selling job for you and your station.

Cash in—Think what this complete selling program can mean to your business. Why not get all the details on this money-making merchandising? Wire, write or phone to the nearest office listed below.

CITIES SERVICE OIL COMPANIES

CITIES SERVICE OIL COMPANY—Chicago, New York, Cedar Rapids, Boston, St. Paul, Grand Forks, Kansas City, Fort Worth, Oklahoma City, Milwaukee, Cleveland, Detroit, Syracuse, Harrisburg.

CITIES SERVICE OIL COMPANY, LTD.—Toronto, Ontario.

ARKANSAS FUEL OIL COMPANY—Shreveport, Little Rock, Jackson, Birmingham, Atlanta, Charlotte, Nashville, Richmond, Miami.

SAVES TWO TO THREE HOURS A DAY

TRUCK SALESMAN SAYS, "I SAVE AT LEAST 2 HOURS A DAY WHICH I NOW SPEND SOLICITING NEW BUSINESS."

it's new! Bennett P.D.Q. DELIVERY PUMP (Power Delivery in Quantities)

Now, small operators can have the time and labor-saving advantages of Power Delivery. Bennett P.D.Q. Pump (gasoline engine, pumping unit, accurate meter, highly visible totalizing register) sells at an amazingly low price compared with the cost of power take-off units—easy terms.

Installation on either side or rear of truck can be made easily. If desired, transfer P.D.Q. from one truck to another.

The Bennett P.D.Q. Pump delivers 16 to 17 gallons per minute. In actual tests it cuts delivery time two-thirds. Write NOW for full details.

May be equipped with Master Meter Duplicator Ticket Printer

MAIL TODAY

QUALITY BUILT Bennett

SERVICE STATION EQUIPMENT CO., Muskegon, Michigan

Yes, I want to cut overhead and increase sales. Send complete details on Bennett P.D.Q. Pump.

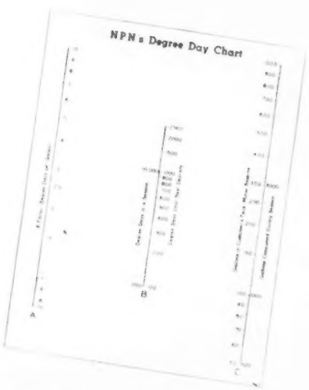
Name.....

Address.....

Degree-Day System Chart $1

- Helps you estimate user's fuel oil needs
- Cuts hauling costs by better scheduling
- Shows if customers are buying elsewhere
- Helps you answer user's complaints

With the Degree-Day Chart you can estimate and anticipate demand for fuel oil by your customers. Temperature fluctuations are quickly and easily plotted on the chart to give you estimated requirement of each customer. With this chart you can sell automatic heat and assure an adequate supply in each user's tank—at the same time you save money through better hauling schedules. To help you, NPN will publish each month, heating oil requirements in Degree-Days for leading cities. If you sell—or want to sell—fuel oil, get one of these charts to keep customers satisfied, costs down, adequate stock on hand at all times.



NPN's Degree-Day Charts are printed on heavy-duty stock and are Cellophane laminated to withstand rough, daily usage. Complete with instructions.

$1 EACH

NATIONAL PETROLEUM NEWS, 1213 W. 3rd St., Cleveland, O.

Attached is check for $..... for ..... copies of NPN's Degree-Day Chart. (Remittance must accompany orders—Ohio purchasers please add 3c for state tax). Charts sent postpaid.

Name .....

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ers using its heating oils with a guide which gives many practical means by which they can control their heating costs and thus secure greater relative efficiency from their burner. Its salesmen and dealers are trained to call the owner's attention to ways in which he may save on his fuel bills. This guide starts out with some fundamental principles of fuel oil combustion.

"It requires about 14 lbs. (183 cu. ft.) of air to burn 1 lb. of fuel oil," it states. "Any amount of air above that actually required to burn the oil is considered excess air, and since it must be heated to the same temperature as the products of combustion, when it leaves your boiler or furnace, it carries this heat up the chimney where it is wasted. Therefore, the more excess air used to burn the oil, the greater these heat losses will be."

It goes on to say that it is possible, by test, to find out whether the proper amount of air is employed in burning the oil by determining the percentage of carbon dioxide in the flue gases leaving the furnace after combustion is completed. "Your oil burner service man uses a portable gas analyzer to make this determination," the home owner is told.

SMOKE is usually the result of a poor air and oil mixture and probably rates next to excess air as a cause of excessive fuel consumption, the guide states. "It is estimated by some authorities that a coating of soot one-eighth in. thick on the boiler heating surfaces can cause an increase in fuel consumption of as much as 25%," it is stated. Tests made in Shell's Oil Burner Testing Laboratory are described which showed that an oil burner operating 80 hours under smoky conditions, lost 5% in overall efficiency (total useful heat obtained from the oil burner), while stack temperature increased 100 degrees to 720 F.

This Shell guide shows by tables how much oil yearly may be wasted if higher inside temperatures than 70 F. are maintained. At 75 degrees, 214 gals. of oil will be "wasted" if average yearly requirements are 1500 gals., it is shown; at 80 degrees, 428 gals.

Another table shows in per cents, savings in fuel that will result from lowering night temperatures various amounts and for various periods of time. Another table shows the reduction in oil consumption that is possible by readjustment of the burner to raise the carbon dioxide content.

A chart is given in the guide, of the fuel savings that can be realized by improvements in construction features of the dwelling. Approximate fuel savings of 10 to 15% are possible where only weather stripping is done, it is shown; from 10 to 20% where storm windows are put on; from 15 to 25% where there is both weather stripping and storm windows; wall and roof in-

sulation make possible 20 to 30% saving in fuel and from 35 to 55% where there is weather stripping and storm windows plus roof insulation.

The guide advises the home owner to keep his oil tank filled during the summer, to prevent condensation of moisture and rusting. If the tank is outside, it should be kept filled during the summer to make sure it is not "floated" from its foundation in heavy summer rains, which may damage connection and entail a repair cost.

Like the Shell Oil Co., Standard Oil Co. of New Jersey, Sinclair Refining and Standard of Indiana, among other oil companies, maintain laboratories where new models of oil burners are tested and first hand information is obtained on oil properties that are important to burner performance and on practical methods by which the efficiency of oil burners in use may be improved. Fuel oil salesmen are trained to inspect installations for faults that are adding to the householder's fuel oil bill.

Standard Oil Co. of Indiana salesmen are taught to use the CO_2 analyzer, draft gauge and stack thermometer in checking the efficiency of installations. This company confines its service to checking, however. Where repairs are needed the salesman explains the importance of having the work done by a regular burner agent or service man, equipped with tools and instruments and parts and refers the owner to such an agent.

The oil company salesmen will work with the home owner, however, in showing him the savings in fuel bills that he can make by proper weather stripping or insulating his house, and by avoiding high inside temperatures, which besides being wasteful, may be unhealthful. Tables are provided showing the equivalent amounts of different kinds of other fuels required to heat a home, as compared with oil. Multiplying the figures in the table by the local fuel price gives the relative cost of heating.

This company's burner research laboratory has studied what can be done in an oil burning system to reduce oil consumption and has found:

"(a) Constant draft in the furnace is necessary for efficient operation of an oil burner and the use of an automatic draft regulator is recommended. If, instead of the usual flapper type, which uses basement air for checking the draft, a regulator which uses no basement air is employed, a warmer basement results and fuel is conserved.

"(b) Changing the fire box of a gun burner installation from standard fire brick to insulating fire brick, which is one-third as heavy and transfers one-third the amount of heat, reduces the fuel bill as much as 10%.

"(c) Radiation losses from the boiler and heat losses through the floor of the furnace can be reduced by proper insulation.

"(d) Adjusting the oil burning rate to the minimum necessary to adequately heat the home in the coldest weather is more efficient and results in more even heating.

"(e) With intermittent operation there is some heat loss up the stack during the down periods, due to basement air being pulled through the furnace and up the stack. Some of the new burners are equipped with an automatic air shutter which prevents air from circulating through the furnace during these down periods. A boiler of this type conserves up to 6 to 8% of the fuel.

"(f) Adjusting the air supply to give the highest CO_2 with clean burning assures the most efficient operation."

To Show Home Owner Relative Cost of Heating with Oil, as Compared with other Fuels

Fuel oil salesmen for oil marketing companies use tables such as this, prepared by Standard Oil Co. of Indiana, which give the equivalent quantities of different fuels required for home heating, to offset the argument that heating with oil is costly.

Multiplying the figures in the table by the local fuel price gives the relative cost of heating by oil and with gas. The table is based on average heating plant efficiencies, with conversion oil burners and on an average grade of coal sold in the middle west.

Tons of Coal, 11,000 B.t.u. lb. Hand Fired	Stoker Fired	Gals. Furnace Oil	*Therms Gas
5	4.4	680	860
6	5.3	816	1033
7	6.2	952	1206
8	7.1	1088	1379
9	8.0	1224	1552
10	8.9	1360	1725
11	9.8	1496	1898
12	10.7	1632	2071
13	11.6	1768	2244
14	12.5	1904	2417
15	13.4	2040	2590
16	14.3	2176	2763
17	15.2	2312	2936
18	16.1	2448	3109
19	17.0	2584	3282
20	17.9	2720	3455

*One therm = 100,000 B.t.u.

Effect of Soot on Rating of Oil Furnaces

The importance of even light deposits of soot on heating surfaces of oil fired boilers or furnaces, in adjusting or testing the heating plant, is discussed in a report by the National Bureau of Standards in co-operation with the federal government's Central Housing Committee.

"It is shown that the rating of a boiler, obtained by a test method based on constant flue-gas temperature, can be seriously affected by soot on the heating surfaces, although the soot may be too slight in amount to affect either the capacity or the efficiency at a constant firing rate," the report concludes. "At constant firing rate the soot has a large effect on the flue-gas temperature."

The report is entitled "Effect of Soot on the Rating of an Oil-Fired Heating Boiler." It can be secured from the Supt. of Documents, Washington, at 10c per copy.

Employes of Seaside Honored for Service

Sixteen Seaside Oil Co. employes, with combined service of 130 years, recently received service pins in recognition of 5, 10 and 15 years of continued work with this organization.

H. B. Kellogg, Seaside's vice-president and general manager, said: "The awarding of these service pins is an important custom with Seaside. We encourage long and pleasant employe relations with the company, as it tends to build a strong, efficient organization with a corresponding high morale and mutual profitable productiveness."

Per Car 'Gas' Consumption Up From 619 to 724 Gallons

While the number of motor vehicles in use by 1939 had climbed to over 28,000,000 from more than 23,000,000 in use in 1929, gasoline consumption in this same 10-year period climbed from 14,311,962,000 gals. in 1929 to 20,654,592,000 gals. in 1939, according to a recent report from the American Petroleum Industries Committee.

Average consumption per motor vehicle in 1929 was 619 gals. compared with 724 gals. in 1939, but the service station cost per gallon (inc. tax) dropped from 21.4c to 18.7c.

However, average gasoline tax per gallon climbed from 3.5c in 1929 to 5.4c in 1939 and the per cent of cost added by tax increased from 19.5% in 1929 to 40.9% in 1939, this report states.

How to Nurse a 'Sick' Station Back to Profitable Basis

THIS could be another story of an "Iowa Plan victim." (See NPN Aug. 21, 1940.)

In a way it is. But mainly it shows how easily management can get "off the track" by not giving the same time, study and effort to its leased outlets as it does to company-operated stations.

This story concerns a major oil company district manager and his "pride and joy," which happened to be station site he had personally selected and bought. Otherwise, it probably would not have come to his particular attention. The chances are that he never would have discovered that the simple things in station operation, so obvious to experienced oil men, are often the cause of much trouble.

The result was that this executive found the extreme importance and necessity for giving uncontrolled outlets the same thought, care and study as company-operated stations. He found that by so doing, these outlets, as well as their personnel, could be made as efficient as company stations. He also found that an executive's success depends squarely on two points: whether he knows his business, and his ability to get his knowledge actually and properly used by others.

Too often, marketers fail to see the trees for the forest. The result is that the forest may be wonderful, and still have a lot of dead timber.

Pictured here is the operator of a "healthy" station checking the cards and 'phoning customers to remind them that their car is due for an oil change

A good example of this is the matter of shifts or "tricks" in service station operation. On the face of it, that wouldn't seem to be a management problem as much as an operator's in running a station. But a study by management of that "little detail" will often result in finding the cause of slipping gallonage. Further it will be found that many factors are involved in making the study and that to do it right, it requires a minimum of 30 days.

Many times it will result in making good men out of helpers who feel they are underpaid, overworked and generally abused. A study of stations will find many such men.

Too often, it has been found that these men gradually work themselves into an attitude of feeling like martyrs. They think they do all the dirty work and are really running the station for $15 or $20 a week, while the boss takes the easy shifts, puts in fewer hours and gets the gravy. There is a cause for this serious condition, and there is a cure.

The cause is that marketers often overlook telling an operator anything about shifts when he is checked in a station. He may have been given the "works' on the best selling and operating methods. If hours were mentioned at all, he was simply told that he was supposed to keep the station open from 7 to 11, or whatever the hours might be.

Then it may be that the operator had regular hours on his last salary job and now that he was the "boss," he set his work schedule so he could spend a lot of time at home with Lucile and the boys.

Here is an actual experience, as related by a district manager of a major oil company, in straightening out such a station. He admitted that he should have known the answer in the first place. But in analyzing the results, he found that he had taken for granted the lessee's knowledge of some of the simple fundamentals of station operation. The manager found that he was wrong in that assumption, and an operator either had to learn by experience, or by being shown or told.

The station in question was a one-bay, 3-pump, modern outlet. It was on a heavily-traveled street in one of the best sections of the city with a high-class neighborhood business. Under former company operation, it averaged 10,000 gallons per month, 180 gallons of oil and 90 grease jobs. It received

the personal attention of the sales manager because it was one of the first locations he had personally selected.

But, when the gallonage dipped about 1/3, he determined to find the answer. The things he did, in their order, which could be used as a guide by any marketer in checking a "sick" station, were as follows:

1. *Traffic was again checked.* It was found to be slightly better than when the station was originally built. It had not increased enough, however, to make the station hard to get into from the street.

2. *New competitive outlets were checked.* The closest new outlet was 7 blocks away, and this competitive factor was negligible.

3. *Nearby competitive stations were checked for "chiseling."* Conditions appeared to be about the same as previously.

4. *Changes in routing of traffic were investigated.* None had been made.

5. *Physical factors of the station itself were checked. This included visibility.* No trees, billboards or other obstructions had come into the picture to make the station "blind" or give low visibility. (200 feet on the side next to the station and 240 feet on the opposite side is considered good visibility.) Accessibility was also checked. There had been no changes in street grading. Approaches to the drive were in good condition. Street paving was good.

6. A "cellar to garret" inspection of the station itself, along the line of NPN's service station inspection form was made. This revealed some things in need of correction but they were not serious enough to particularly affect the gallonage.

WITH the completion of these investigations, the sales manager knew that the fault did not lie with the property. He knew it was not the fault of the products or the company—an extremely successful sales organization.

Ordinarily, this would have been the cue to find a new operator pronto. But a rather close investigation of the operator who had been selected with extreme care in the first place, showed that, unless some very exceptional man could be found, a change of operators would not help things.

The operator was a high-class man; intelligent, trustworthy, a good housekeeper and a good salesman. So as yet the answer hadn't been found.

But the sales manager decided to find it—or else. He made a deal with the man who formerly managed the station under company operation. That man was to go to work there as a helper and try and find the trouble. He did. And it didn't take him long to do it. Perhaps the reason it was overlooked in the first place was because it was so simple.

The operator had simply not been told the importance of planning his shifts in such a way as to be at the station himself during the rush periods—

This TYPE GLOBE — FITS All TYPE PUMPS!

IF YOU wanted to sell a different brand of gasoline, how many different types and sizes of glass panels would you need? . . . . Make a survey and the total will astonish you!

Why not cut your replacement costs by standardizing on Cincinnati *Beacon* All-Glass Globes. This type globe fits all type pumps. . . . . And the globes can be turned to face on-coming motorists from several directions.

The brilliantly colored designs are permanently *fired into* the detachable convex glass faces. The design can't peel, crack or fade.

We probably have your design on file. If you are planning a new one, make a rough sketch, indicate colors, and we will submit a finished drawing FREE!

The All-Glass, Separable Face Globe is protected by U. S. Patent No. 1,790,871

CINCINNATI *Beacon* GLOBES

Clip this Coupon MAIL TODAY!

GLOBE DIVISION
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Without obligation on our part, please send us

☐ Catalog and prices on _____ (number of globes or faces) _____ (number of colors)

☐ Drawing, in color, of new design for our gasoline, rough color sketch of which is enclosed.

NAME _____

FIRM NAME _____

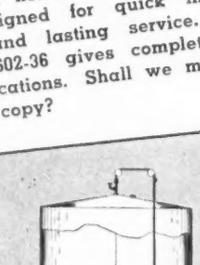
STREET ADDRESS _____

CITY _____ STATE _____

Listen, Charlie, it's not only pretty darn dangerous . . . but you're wasting time as well if you're checking your tanks with an old-fashioned gauge stick. Time spent slipping around on the top of a tall storage tank could be devoted to something more profitable, don't you think?

You see with Simplex Tank Gauges it takes just an instant to accurately check your tanks . . . losses from any source show up immediately . . . . evaporation from frequently opened man-holes is entirely eliminated. No expensive runways to build . . . not one step of climbing.

The Simplex Gauges fit old and new tanks alike—vertical or horizontal . . . they are designed for quick installation and lasting service. Bulletin 602-36 gives complete specifications. Shall we mail you a copy?



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and to rotate the hours so that the regular customers would know him. Neither had he learned that, to gain the respect of his help, he must do his share and take some bad as well as good shifts.

Moreover, he did not realize the importance of knowing the peak and low periods at the station; the best time to open and close; and the arrangement of hours so that there was plenty of experienced help on hand during rush periods.

He had not learned that during the dull periods, men could be out soliciting or simply off duty; that there was a difference between putting in long hours at a station and actually working at a station.

He took it as a matter of course that 2 of his helpers spent an hour or so every afternoon back of the station pitching horse shoes. He didn't realize that these same boys in talking to customers told them of their long hours and gave him a build-up as a slave driver, when, as a matter of fact, actual working time was probably about 3.5 hours a day.

It was also found that the operator of this station made the serious mistake of hiring inexperienced help and expecting them to do a good job without any particular training. He overlooked passing on to them the things his company had taught him. He did not supervise their solicitation talk to customers, nor impress them with the importance of good housekeeping and clean restrooms. Yet, he expected them to produce results when he was off duty.

After finding these things, with the co-operation of the operator, a study was made to determine the proper way to arrange schedules.

A record of each day's sales on gasoline, oil and grease jobs was kept for 30 days. A ruled sheet like this was used:

It will be seen that the gasoline sales were shown by individual sales, and it was found that the busiest times did not always indicate the heaviest gallonage. The 1, 2 or 5 gallon buyers are usually of the same type: women buyers on the way down town to shop; boys with 50 cents and a date and so on. Pay days also changed the picture somewhat. Many cash buyers go lighter on purchases the further they get from pay day. But when the "ghost walks" many fill up.

As a result of the 30-day survey, it was a simple matter to arrange the hours to properly care for the station. It involved a complete change in the operator's hours. He scheduled himself to be on the job during the rush periods. Thus, he became better acquainted with the customers. The service was better. He was in closer contact with his helpers and passed on to them the training he received from his company.

With the reorganization, the helpers had fewer hours of work. But the operator was able to pay them more money, because he was making more. They were happier, due to their better sales ability and co-operation. But of prime importance, the station gallonage went back to where it should have been.

But the mere scheduling of hours will not bring a station out of the red unless the other factors enumerated in this article are considered. And no 2 stations are alike, so a fast rule cannot be laid down to cover them all.

Marketers who wish to do so, can go into more detail in analyzing station shifts.

A marketer in New Orleans followed a plan along the lines explained here, but went into a lot more detail. A record was kept on gallonage for half hour periods. In addition, the day's total expenses, including overhead and every item of expense, were broken down by half hour periods. Then the gross profits for half-hour periods were

A. M.	Gasoline	Oil	Grease Jobs
6:00- 6:30			
6:30- 7:00			
7:00- 7:30			
7:30- 8:00			
8:00- 8:30			
8:30- 9:00			
9:00- 9:30			
9:30-10:00			
10:00-10:30			
10:30-11:00			
11:00-11:30			
11:30-12:00			
P. M.			
12:00-12:30			
12:30- 1:00			
1:00- 1:30			
1:30- 2:00			
2:00- 2:30			
3:00- 3:30			
3:30- 4:00			
4:00- 4:30			
4:30- 5:00			
5:00- 5:30			
5:30- 6:00			
6:00- 6:30			
6:30- 7:00			
7:00- 7:30			
7:30- 8:00			
8:00- 8:30			
8:30- 9:00			
9:00- 9:30			
9:30-10:00			
10:00-10:30			
10:30-11:00			
11:00-11:30			
11:30-12:00			

determined. They even went so far as to record air and water customers.

When the survey was finished, it really gave an operations picture. As a result, working hours of 4 men were cut from 40 to 38. Opening and closing hours were changed. A saving of 15 hours per week was made on night operation, with no loss of business, which cut the light bill. Business improved by reason of better service, and the helpers were able to make a higher rate of pay for less hours of work.

Marketers who adopt this method of determining proper station shifts or "tricks," will find it a rather tedious drawn-out affair. But it is a lot cheaper than changing operators or taking a gallonage loss on the chin because—on the surface—there is nothing to do about it.

Petroleum By Water Advantages Claimed

WASHINGTON — Advantages of transporting petroleum and its products in water-borne commerce, is seen by Chairman Joseph J. Mansfield, of the House Rivers and Harbors Committee, are stressed in a statement he has prepared to show importance of rivers and harbors improvements to national defense.

Statement, which has been published in the CONGRESSIONAL RECORD, first calls attention to the "essential benefits to national defense of the coastal harbors which permit the efficient handling of oil and gasoline."

Discussing the 9-foot barge channel on the lower Mississippi, Rep. Mansfield relates how oil and gasoline are hauled by water from refineries at Baton Rouge to St. Louis, Kansas City, St. Paul and Minneapolis, Chicago, Louisville, Cincinnati, Pittsburgh, Nashville, and other cities, and then asserts this oil and gasoline could not be distributed by any other form of transportation with the same efficiency.

Again in discussing the new 75% completed 6-foot channel from St. Louis to Sioux City, Rep. Mansfield cites the large inbound shipments of fuel oil going to Kansas City by water.

Ohio Gas Consumption Increased by 7%

CLEVELAND — Gasoline consumption in Ohio was 7% this past July, as compared with July, 1939, according to figures based on State Department of Taxation reports. July's consumption this year was 126,750,028 gals, compared with 118,299,708 gals. in 1939.

Figures for the first 7 months this year show that 783,192,930 gals. were consumed compared with 730,226,979 gals. for a like period in 1939.

TRADEMARKS

The following are trademark applications pertinent to our field pending in the United States Patent Office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Mark Company, Munsey Building, Washington, D. C., trademark specialists.

KEYCUT, Ser. No. 434,121, Keystone Lubricating Company, Philadelphia, Pa. Filed July 18, 1940. For lubricating oils and particularly cutting oils. Published: September 10, 1940.

WILSONITE, Ser. No. 433,590, Andrew Wilson, Inc., Springfield, N. J. Filed July 1, 1940. For insecticides and fungicides. Published September 10, 1940.

NU-LEAF, Ser. No. 433,849, California Spray-Chemical Corporation, Wilmington Delaware and Richmond, California. Filed July 11, 1940. For parasiticides. Published September 10, 1940.

CALFAST, Ser. No. 434,561, General Chemical Company, New York, N. Y. Filed August 1, 1940. For insecticides. Published September 10, 1940.

IT'S IN THE REFINING—5 in 1 BLEND PLUS LEAD TETRRETHYL — ALTITUDE BALANCED and representation of scales balancing refinery and automobile and gasoline pumps, Ser. No. 430,260, Yale Oil Corporation of South Dakota, Billings, Montana. Filed April 1, 1940. For gasoline. Published September 10, 1940.

PROREX, Ser. No. 433,265, Socony-Vacuum Oil Co. Inc., New York. Filed June 21, 1940. For refined petroleum distillate oils suitable for use in textile manufacture as penetrating oils, and for other industrial uses, not including lubrication. Published July 30, 1940.

* * *

HY POINT LUBRICANT CO., Ser. No. 430,377, Ira D. Bigham, dba Hy-Point Lubricant Company, Kansas City, Mo. Filed: April 5, 1940. For lubricating oils and greases and lubricating oil and grease compounds for machinery. Published: September 24, 1940.

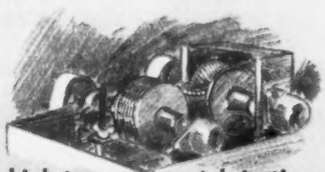
dag
COLLOIDAL GRAPHITE
does double duty

COLLOIDAL GRAPHITE USED FOR SPEED CONDITIONING OF LINK-BELT P. I. V. GEAR CHAINS AND LUBRICATION OF LINK-BELT CHAIN CONVEYOR SYSTEMS OPERATING AT HIGHER THAN NORMAL TEMPERATURES

For Link-Belt Company, "dag" colloidal graphite is now doing double duty.

First, added to regular oil, it is used to run-in the chain of unique construction used in the Link-Belt P. I. V. Gear Variable Speed Transmission. Forming a durable, self-lubricating graphoid surface on the friction parts, run-in time and wear is reduced.

The second use involves the



high temperature lubrication of Link-Belt's chain conveyor systems used throughout industry. Many of them operate in temperatures above the limits of oil (450°F. and up) - a condition decidedly to the liking of graphite.

Being highly stable in light viscosity fluids, "dag" colloidal

graphite dispersed in kerosine or carbon tetrachloride answers the carbon, smoking, flake-off problem. These fluids quickly evaporate under high heat with a minimum of smoke and carbon, leaving only pure graphite to furnish clean lubrication on the working parts of the conveyor.

A note on your company letterhead will bring Technical Bulletin Nos. 112 and 130 describing more fully why and how run-in and high temperature lubrication can be materially helped with "dag" Brand colloidal graphite.

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Federal Labor Unit Reports on Disputes

N. P. N. News Bureau

WASHINGTON—Department of Labor Conciliation's Service reports handling during the fiscal year ended July 1, 20 labor disputes in the petroleum industry involving 9890 workers. This compares with 11 disputes, involving 1311 workers in the year preceding. Total disputes handled by the Conciliation Service for the 1940 fiscal year was 1977 as against 1678 during 1939.

Other situations handled by the service in the petroleum industry (including consultations looking to prevention of disputes) numbered 81 and involved 3178 workers in the 1940 fiscal year, as against 46 such situations, involving 6981 workers, in 1939.

National Petroleum News Ownership Statement

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, and March 3, 1933, of National Petroleum News, published weekly at Cleveland, Ohio, for October 1, 1940, State of Ohio, County of Cuyahoga.

Before me, a notary public in and for the State and County aforesaid, personally appeared A. E. Kraft, who, having been duly sworn according to law, deposes and says that she is the business manager of the National Petroleum News and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, The National Petroleum Publishing Company, Cleveland, Ohio; editor, Warren C. Platt, Cleveland, Ohio; managing editor, V. B. Guthrie, Cleveland, Ohio; and business managers are: A. E. Kraft, Cleveland, Ohio.

2. That the owners are: The National Petroleum Publishing Co., Cleveland, Ohio; Warren C. Platt, Cleveland, Ohio; Bess H. Platt, Cleveland, Ohio; A. E. Kraft, Cleveland, Ohio; Margaret H. Fretter and Margaret Fretter Nye, Cleveland, Ohio.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of the total amount of bonds, mortgages, other securities are None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holders appear upon the books of the company as trustees or in any other fiduciary relation, the names of the person or corporation for whom each trustee is acting, is given; also that the said two paragraphs contain statements embracing affiants' full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by her.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise to paid subscribers during the six months preceding the date shown above is (This information is required from daily publications only).

(Signed) A. E. KRAFT,
Business Manager

Sworn to and subscribed before me this 24th day of September, 1940.

(Signed) H. L. RICHEY,
Notary Public

(My commission expires May 8, 1942.)

MARKETS

Gulf

NEW YORK, Sept. 28.—Gasoline was firmer at the Gulf the past week, according to reports here and from the southwest. Indications were that "much of the recent pressure on gasoline" had been relieved, with a considerable amount of "distress" material said to have been sold. One source estimated that 10 to 12 cargoes of gasoline had been sold for domestic shipment in the past two weeks.

Export business was said to be "virtually non-existent" except for a few cargoes of 74 oct. leaded gasoline reported to have been sold to Porto Rico and Cuba recently. Prices on the export transactions were not disclosed. A "considerable amount" of aviation gasoline previously sold to Japan was said to be moving from the Gulf at the present time.

Sale of an 80,000-bbl. cargo of minimum 80 oct. ('39 Research) gasoline at 4c for October lifting was reported by a Gulf refiner, up 0.125c from last reported sale price. Some refiners were asking up to 5c for this grade. Early in the week, a refiner-buyer said he had purchased "several" cargoes of 72-74 oct. leaded gasoline at 3.50c but later reports were that this material was not available under 3.625c. Refiners' asking prices ranged up to 4.75c.

Sales of at least 3 cargoes of No. 2 fuel at 3.25c also were reported, 0.125c below previous lows, and trade reports indicated that at least 5 more cargoes of the material were being offered at 3.25c at the end of the week. Asking prices reported for No. 2 fuel ranged up to 3.625c.

A Gulf refiner reported selling cargo of approximately 80,000 bbls. of Bunker "C" fuel at 80c a bbl. for October lifting. Refiners' asking prices ranged up to 90c.

Kerosine was said to be "firm" at 4c with on refiner, out of the open market for some time, offering at 4.125c for immediate shipment only. Sale of a cargo of 41-43 w.w. at 4c was reported by another refiner.

Pennsylvania

CLEVELAND, Sept. 28.—Refined products quotations for the most part were reported unchanged by western Pennsylvania refiners the last week in September. All light products and wax were in good shape, while lubes continued slow, according to reports.

Wax appeared to be the firmest item on the list. A good bit of the recent heavy buying was believed to be for the account of munitions manufacturers. Several refiners said they were sold up for a month to six weeks. Quotations reported for white crude scale ranged from 2.50 to 2.75c per lb., New York.

There were reports of gasoline price shading, particularly from the lower field, despite the fact that supplies were said to be scarce. Quotations reported for high octane grades ranged from 5.75 to 6c. Unconfirmed reports were that high octane was being offered for restricted shipment at 5c and up. One lower field refiner said he was "meeting competition" for Ohio delivery.

Atlantic Coast

NEW YORK, Sept. 28.—Conflicting gasoline price trends were reported along the Atlantic Coast the past week. Prices were higher at New York, while at Albany, Portland, Boston and Providence lower prices were reported for some grades. Quotations for other refined products for the most part were reported unchanged at all points.

Quotations reported for 72-74 oct. gasoline at New York ranged from 5 to 6.50c for tank cars, 4.75 to 6.50c for barges, up 0.25 to 0.375c on the lows.

Low quotations reported for 72-74 oct. at Albany were down 0.4c to 5.30c, and down 0.2c to 5.50c and 5.40c at Portland and Providence, respectively. Low octane gasoline was offered 0.2c lower at 5.25c at Boston, 5.15c at Providence.

Mid-Western

CHICAGO, Sept. 28.—A Chicago tank car marketer reported selling 72-74 oct. gasoline at 3.875c, F.O.B. Group 3 the past week. This was 0.125c under last reported sale price on this grade. Aside from this, quotations for refined products were reported unchanged by both refiners and tank car marketers.

Five marketers said they were quoting 4c for 72-74 oct., while Group 3 quotations reported by refiners ranged from 4.625 to 5c. Gasoline movement continued "above estimates for this month," three refiners said.

Most sellers said demand for burner fuels was "picking up" as result of cooler weather in the middle west. Call for industrial fuels and kerosine was reported steady by both refiners and tank car marketers. Marketers reported quoting 3.25 to 3.50c for No. 1 p. w., 3.125 to 3.50c for No. 2 straw, and 3 to 3.375c for No. 3 fuel. Quotations reported by refiners ranged from 3.375 to 3.75, 3.25 to 3.50, and 3.125 to 3.375, for the three grades, respectively.

Four tank car marketers reported the following open spot sales during the week: 16 cars of 72-74 oct. leaded gasoline, 4 cars at 3.875c, and 12 cars at 4; 3 cars of 63-66 oct. at 3.50c; 3 cars of 60 oct. and below at 3.125c; 3 cars of Ethyl, 1 car at 4.50c, 1 at 4.625c, and 1 at 4.75c; and 1 car of No. 3 fuel oil at 3c.

Mid-Continent

TULSA, Sept. 28.—Gasoline and kerosine price advances for tank car and tank truck delivery of 0.375 to 1c by three North Texas refiners highlighted Mid-Continent markets the past week. These advances followed closely announcements by Continental Oil Co., Magnolia Petroleum Co., and The Texas Co. of advances in their "subnormal" tank wagon prices in most sections of Texas.

Refiners' new quotations reported for North Texas ranged from 4.625 to 5.25c for 72-74 oct.; 4.25 to 5c for 63-66; 3.875 to 4.50c for 60 oct. and below; 4.25 to 4.75c for 60-62, 400 e.p.; and 3.50 to 4c for 41-43 W.W. kerosine.

West Texas gasoline prices also were reported 0.125 to 0.25c higher for 72-74 oct. and 60 oct. and below by two refiners. Quotations reported for these two products ranged from 4.875 to 5.125c, and 3.875 to 4c, respectively.

Oklahoma and Kansas gasoline quotations were reported unchanged and orders continued in good volume, according to most refiners. One car of 72-74 oct. was reported sold by an Oklahoma refiner at 5.125c; another Oklahoma refiner continued to report sales of 72-74 at 4.125c for restricted shipment into competitive areas. Quotations reported by Oklahoma refiners for 72-74 ranged from 4.625 to 5.125c.

Burning oil movement continued in good volume and stocks were closely held, most Mid-Continent refiners said One refiner said he was "sold up solid" for next 30 days on No. 1 p.w. and No. 6 fuels.

Grade 26-70 natural gasoline supplies were reported "scarce". Reported sales continued at 2.25c, F.O.B. Group 3 for total of 12 cars; and 1.75c, F.O.B. Breckenridge for total of 31 cars. Six cars were also reported sold at 2.50c, F.O.B. Oklahoma plant for Oklahoma delivery.

California

LOS ANGELES, Sept. 28.—Spot sales West Coast the past week were reported to include two cargoes of U. S. Motor gasoline to a Pacific foreign port at 4.25c per gal.

San Pedro Bunker C fuel oil price was reduced to $0.75 per bbl., Sept. 27, by Standard Oil Co. of California, a decline of 15c per bbl.

Fuel oil prices on the domestic market, however, were reported firmer at a range of $0.55-$0.625 per bbl. for light grades and $0.475-$0.525 per bbl. for heavy grades at independent plants in the Los Angeles Basin.

Many independent refiners in the Basin area were said to be delivering gasoline in that district at 4.5c per gal. for third grade, 5.75c for leaded gasoline and 5.5c for Ethyl. Suppliers, however, were said to be unwilling to sell at these prices unless all three grades were taken by the retailer.

REFINERY and SEABOARD PRICES

In bulk lots by Motor Transport, Tank Car, Barge or Tanker as shown

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

HOW PRICES ARE REPORTED—

Refinery and Seaboard prices in National Petroleum News are gathered by PLATT'S OILGRAM and are as published in the Monday issue of the OILGRAM.

PLATT'S OILGRAM is a reporting service issued in three identical editions daily from News Bureaus at New York, Cleveland, and Tulsa, Okla. PLATT'S OILGRAM gathers and publishes what its publisher and representatives believe to be accurate news of sales, prices and current happenings affecting the oil industry and that will be of interest to its subscribers. As this information is usually private, OILGRAM reports it according to what it is able to obtain from sources deemed reliable.

All information is supplied without guarantee as to its completeness, accuracy, time of transmission or promptness of delivery.

The subscriber receives this information for his private use and not for resale or further distribution.

Publisher reserves the right to change the extent, nature and form of showing this information at any time.

Prices shown in the tables are quotations (meaning sellers' general offers or posted prices), or actual sales prices, reported to OILGRAM by refiners for "open spot" transactions, except as otherwise specified.

Prices arrived at by discounts off a specified price or "market date of shipment," prices named in contracts or prices arrived at in accordance with any arrangement made prior to date of sale, are not for "open spot" transactions and therefore are not considered in making the price tables. Prices made to brokers and prices in "inter-refinery" transactions are also not considered except as may be noted.

All prices are for "immediate" shipment except in Gulf Coast bulk transactions where shipment is generally to be made in ninety days. Prices are FOB refineries, pipelines, or tanker terminals in districts designated.

Prices shown are for quantities in bulk such as tank car lots, motor transport lots or barge lots; and in cents per gallon; heavy fuel oils are in dollars per barrel of 42 U.S. gallons; wax and petrolatums are in cents per pound. Prices applying to barges or cargoes only are so designated.

Prices do not include taxes or inspection fees. Prices are published at the close of the business day.

Mid-Western prices in the tables were gathered from refiners with offices located in Chicago and the surrounding territory. While the prices are quoted on a Group 3 (Oklahoma) freight basis, this is in accordance with the custom of the oil industry which uses Group 3 as a price basis for the ease of comparing prices even when the material originates in another refining district. Other refinery prices are given by and for the particular refining district where the material is made and from which it is shipped.

When prices obtained by OILGRAM do not conform to these conditions the exception and the new conditions are noted in the news lead or in conjunction with the price table by footnote or otherwise, for the particular refinery or sales district involved.

Crude oil and products covered by OILGRAM'S news and price service, except where noted, have been represented to the publisher as fully up to the customary trade specifications indicated and according to the generally accepted methods of test; and all crude oil and all products thereof as having been lawfully produced and transported.

Any apparent error should be reported to the nearest OILGRAM or National Petroleum News office at once as no correction will be made after the second issue of the OILGRAM or National Petroleum News following its publication.

Summary of Daily Gasoline Prices (Sept. 24 to Sept. 30)

U. S. Motor, (ASTM octane)	Latest Prices Mon. Sept. 30	Sept. 27	Sept. 26	Sept. 25	Sept. 24
72-74 octane:					
Oklahoma	(r) 4.625–5.125	(r) 4.625–5.125	(r) 4.625–5.125	(r) 4.625–5.125	(r) 4.625–5.125
Mid-Western (Group 3 basis)	4.625– 5.00	4.625– 5.00	4.625– 5.00	4.625– 5.00	4.625– 5.00
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(t) 4.625–5.25	4.625– 5.25	4.625– 5.25	4.625– 4.75	4.625– 4.75
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.875–5.125 (2)	4.875–5.125 (2)	4.875 (2)	4.875 (2)	4.875 (2)
63-66 octane:					
Oklahoma	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75
Mid-Western (Group 3 basis)	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(t) 4.25 –5.00	(s) 4.25 –5.00	(s) 4.25 –5.00	4.00 – 4.625	4.00 – 4.625
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.50 (2)	4.50 (2)	4.50 (2)	4.50 (2)	4.50 (2)
60 octane & below:					
Oklahoma	3.875– 4.25	3.875– 4.25	3.875– 4.25	3.875– 4.25	3.875– 4.25
Mid-Western (Group 3 basis)	3.875– 4.25	3.875– 4.25	3.875– 4.25	3.875– 4.25	3.875– 4.25
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(t) 3.875– 4.50	(s) 3.875–4.50	(s) 3.875–4.50	3.50 – 4.00	3.50 – 4.00
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	3.875– 4.00 (2)	3.875–4.00 (2)	3.875 (2)	3.875 (2)	3.875 (2)
Motor Gasoline, 72-74 octane (ASTM):					
New York harbor	5.00 – 6.50	5.00 – 6.50	4.625– 6.50	4.625– 6.50	4.625– 6.50
Philadelphia district	5.25 – 7.00	5.25 – 7.00	5.25 – 7.00	5.25 – 7.00	5.25 – 7.25
Baltimore district	5.50 – 7.25	5.50 – 7.25	5.50 – 7.25	5.50 – 7.25	5.50 – 7.25
Motor Gasoline:					
74-76 Octane: (L-3)					
Bradford-Warren (Western Penna.)	6.00	6.00	6.00	6.00	6.00
Other Districts (Western Penna.)	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00
72-73 Octane: (L-3)					
Bradford-Warren (Western Penna.)	5.75 (2)	5.75 (2)	5.75 (2)	5.75 (2)	5.75 (2)
Other Districts (Western Penna.)	5.75	5.75	5.75	5.75	5.75

REFINERY PRICES

Gasoline U. S. Motor (ASTM Octane) except where otherwise specified

Prices Effective	Sept. 30	Sept. 23
OKLAHOMA		
72-74 oct.	(r) 4.625–5.125	(r) 4.625–5.125
63-66 oct.	4.25 – 4.75	4.25 – 4.75
60 oct. & below	3.875– 4.25	3.875– 4.25
60-62 400 e.p.	4.00 (2)	4.00 (2)
MID-WESTERN		
72-74 oct.	4.625– 5.00	4.625– 5.00
63-66 oct.	4.25 – 4.75	4.25 – 4.75
60 oct. & below	3.875– 4.25	3.875– 4.25
N. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
72-74 oct.	(t) 4.625–5.25	4.625– 4.875
63-66 oct.	(t) 4.25 –5.00	4.00 – 4.625
60 oct. & below	(t) 3.875–4.50	3.50 – 4.00
60-62, 400 e.p.	4.25 –4.75 (2)	4.00 (2)
W. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
72-74 oct.	4.875–5.125 (2)	4.875 (2)
63-66 oct.	4.50 (2)	4.50 (2)
60 oct. & below	3.875–4.00 (2)	3.875 (2)
CENT. W. TEX. (Prices to truck transports)		
72-74 oct. (L-3)	4.50 (1)	4.50 (1)
67-69 oct. (L-3)	3.75 (1)	3.75 (1)
62 oct. & below (L-3)	3.25 (1)	3.25 (1)
KANSAS (For Kansas destinations only)		
72-74 oct.	4.875– 5.125	4.875– 5.125
63-66 oct.	4.50 – 4.75	4.50 – 4.75
60 oct. & below	4.125– 4.375	4.125– 4.375

Prices Effective	Sept. 30	Sept. 23
ARK. (FOB Ark. plant of one refiner, for shipment to Ark. & La.)		
72-74 oct.	4.75	4.75
70-72 oct.	4.625	4.625
60 oct. & below	4.125	4.125
WESTERN PENNA. (Motor gasoline.)		
Bradford-Warren:		
74-76 oct. (L-3)	6.00	6.00
72-73 oct. (L-3)	5.75 (2)	5.75 (2)
Naphtha		
Untreated naphtha	.....	.....
Stoddard Solvent	.....	.....
Other districts:		
74-76 oct. (L-3)	5.75 – 6.00	5.75 – 6.00
72-73 oct. (L-3)	5.75	5.75
Naphtha		
Untreated naphtha	5.50 – 5.75	5.50 – 5.75
Stoddard Solvent	5.75 – 6.00	5.75 – 6.00
CENTRAL MICHIGAN (f)		
U.S. Motor: (Oct. L-3)		
72-74 oct.	6.25 – 7.00	6.25 – 7.00
67-69 oct.	5.50 – 6.25	5.50 – 6.25
Str.-Run Gasoline	(g) 4.25–5.00	(g) 4.25–5.00
OHIO (S. O. Ohio quotations for statewide delivery and subject to exceptions for local price disturbances)		
72-74 oct.	7.125	7.125
CALIFORNIA U.S. Motor:		
58-61 grav., 375-400 e.p., 65 oct. & above	5.50 – 8.00	5.50 – 8.00
54-58 grav., for outside state shipment	5.00 – 6.50	5.00 – 6.50
54-58 grav., for instate shipment	4.25 – 6.25	4.25 – 6.25

Kerosine, Gas & Fuel Oils

Prices Effective	Sept. 30	Sept. 23
OKLAHOMA		
41-43 grav. w.w.	3.875– 4.25	3.875– 4.25
42-44 grav., w.w.	4.00 – 4.625	4.00 – 4.625
Range Oil	3.50 – 3.875	3.50 – 3.875
No. 1 P.W.	3.375– 3.75	3.375– 3.75
No. 1 straw	3.25 – 3.50	3.25 – 3.50
No. 2 straw	3.25 – 3.625	3.25 – 3.625
No. 2 dark	3.375 (1)	3.375 (1)
U.G.I. gas oil	3.25 (1)	3.25 (1)
No. 3 fuel	3.125–3.375 (2)	3.125–3.375 (2)
No. 6 fuel	$0.55 (2)	$0.55 (2)
14-16 fuel	$0.85 (1)	$0.85 (1)
MID-WESTERN		
41-43 grav. w.w.	3.875– 4.25	3.875– 4.25
42-44 grav. w.w.	4.00 – 4.625	4.00 – 4.625
Range Oil	3.50 – 3.875	3.50 – 3.875
No. 1 p.w.	3.375– 3.75	3.375– 3.75
No. 1 straw	.....	.....
No. 2 straw	3.25 – 3.50	3.25 – 3.50
No. 3	3.125– 3.375	3.125– 3.375
No. 5	$0.75 (1)	$0.75 (1)
No. 6	$0.50–$0.55 (2)	$0.50–$0.55 (2)
N. TEX. (For shpt. to Tex. & N. M dest'ns.)		
41-43 grav. w.w.	3.50 – 4.00	3.375– 3.875
No. 1 P.W.	3.875 (1)	3.875 (1)
KANSAS (For Kansas destinations only)		
41-43 grav. w.w.	4.25 (1)	4.25(1)
42-44 gravity w.w.	4.125– 4.375	4.125– 4.375
No. 1 p.w.	3.625– 3.875	3.625– 3.875
No. 6 fuel	$0.60-$0.625 (2)	$0.60-$0.625 (2)

(f) Prices FOB Central Michigan refinery group basis for shipment within Michigan; shipments may originate at plants outside Central group. (g) Excluding Detroit shipment. (h) For shipment to Ark. points only. (r) One refiner reports quoting "4.125 to 4.625" for 72-74 oct., the lower price applying only to shipments into restricted competitive areas. (s) One refiner reports quoting 4c for 63-66 oct., and 3.50c for 60 & below, for shipment into restricted competitive areas. (t) One refinery reports quoting 4.625c for 72-74 oct., 4c for 63-66 oct., and 3.50c for 60 oct. & below for shipment into restricted competitive areas.

REFINERY PRICES (Continued)

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

Kerosine, Gas & Fuel Oil

(Continued)

Prices Effective	Sept. 30	Sept. 23
ARK. (F.o.b. Ark. plant of one refiner for shipment to Ark. and La.)		
41-43 grav. w.w.	4.25	4.25
No. 1	3.625	3.625
No. 2	3.375	3.375
28-32 zero fuel	3.25	3.25
Tractor Fuel	(h)4.25	(h)4.25
WESTERN PENNA.		
Bradford-Warren:		
45 grav. w.w.	5.00 – 5.375	5.00 – 5.125
46 grav. w.w.	5.25 (1)	5.25 (1)
36-40 gravity	5.00 – 5.125	5.00
Other districts:		
45 grav. w.w.	4.75 – 5.00	4.75 – 5.00
46 grav. w.w.	4.875-5.125 (2)	4.875-5.125 (2)
47 grav. w.w.	4.875 – 5.25	4.875 – 5.25
36-40 gravity	(l) 4.00 – 4.25	(l) 4.00 – 4.25
CENTRAL MICHIGAN (f)		
47-49 gravity w.w.	4.75 – 5.00	4.75 – 5.00
P.W. Distillate	4.50 – 4.75	4.25 – 4.75
No. 3 gas oil, Str.	4.00 – 4.25	4.00 – 4.25
U.G.I. gas oil	3.25 – 4.00	3.25 – 4.00
Fuel Oils (Vis. at 100):		
500-700 Vis.	2.50–3.00 (2)	2.50–3.00 (2)
300-500 Vis.	2.75–3.25 (2)	2.75–3.25 (2)
100-300 Vis.	3.25–3.50 (1)	3.25–3.50 (1)
CALIFORNIA		
40-43 grav. w.w.	4.50 – 6.00	4.50 – 6.00
San Joaquin Valley:		
Heavy fuel	$0.50 –$0.75	$0.45 –$0.75
Light fuel	$0.55 –$0.85	$0.55 –$0.85
Diesel fuel	2.75 – 4.00	2.75 – 4.00
Stove dist.	2.75 – 5.00	2.75 – 5.00
Los Angeles:		
Heavy fuel	$0.50 –$0.70	$0.45 –$0.60
Light fuel	$0.55 –$0.75	$0.45 –$0.70
Diesel fuel	2.50 – 4.00	2.75 – 4.00
Stove dist.	2.50 – 4.00	2.50 – 4.00
San Francisco:		
Heavy fuel	$0.80	$0.80
Light fuel	$0.90	$0.90
Diesel fuel	4.50	4.50
Stove dist.	5.50	5.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Lubricating Oils

WESTERN PENNA.

Prices are given by Penna. refiners as their quotations to jobbing and compounding trade only. Prices to other refiners generally are lower.

Viscous Neutrals — No. 3 col. Vis. at 70° F.

200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	24.50 (1)	24.50 (1)
10 p.t.	23.50 (1)	23.50 (1)
15 p.t.	22.50 (1)	22.50 (1)
25 p.t.	21.00 –22.00	21.00 –22.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	22.50 (1)	22.50 (1)
10 p.t.	21.50 (1)	21.50 (1)
15 p.t.	20.50 (1)	20.50 (1)
25 p.t.	19.00	19.00
Cylinder Stocks		
Brt. stk., 145-155 vis. at 210°, 540-550 fl., No. 8 col.		
10 p.t.	14.50 (1)	14.50 (1)
15 p.t.	13.50 (1)	13.50 (1)
25 p.t.	12.00 –13.00	12.00 –13.00
600 S.R. filterable	7.00 – 8.00	7.00 – 8.00
650 S.R.	8.00 – 9.00	8.00 – 9.00
600 fl.	9.00 – 9.50	9.00 – 9.50
630 fl.	11.00 –13.00	11.00 –13.00

MID-CONTINENT (F.o.b. Tulsa)

Neutral Oils (Vis. at 100° F. 0 to 10 P.P.)

Pale Oils:

Vis. Color		
60-85—No. 2	5.25 – 5.75	5.25 – 5.75
86-110—No. 2	5.25 – 6.25	5.25 – 6.25
150—No. 3	8.00 –10.25	8.00 –10.25
180—No. 3	8.50 –10.50	8.50 –10.50
200—No. 3	8.50 –11.00	8.50 –11.00
250—No. 3	10.00 –12.00	10.00 –12.00
280—No. 3	10.50 –13.75	10.50 –13.75
300—No. 3	11.50 –14.25	11.50 –14.25

Lubricating Oils (Cont'd)

Prices Effective	Sept. 30	Sept. 23
Red Oils:		
180—No. 5	8.50–9.00 (2)	8.50–9.00 (2)
200—No. 5	8.50–10.00 (2)	8.50–10.00 (2)
280—No. 5	11.50–12.00 (2)	11.50–12.00 (2)
300—No. 5	11.00 –12.00	11.00 –12.00

Note: Viscous Neutrals, 15-25 p.p. generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils.

Bright Stock—Vis. at 210°		
200 Vis. D	18.00 (1)	18.00 (1)
150-160 Vis. D:		
0 to 10 p.p.	13.50 –16.00	13.50 –16.00
10 to 25 p.p.	13.00 –15.50	13.00 –15.50
25 to 40 p.p.	12.50–15.00 (2)	12.50–15.00 (2)
150-160 vis. E	12.50 –15.00	12.50 –15.00
120 Vis. D:		
0 to 10 p.p.	12.50 –15.25	12.50 –15.25
25 to 40 p.p.	14.375 (1)	14.375 (1)
600 S.R. Dark Green	7.00 (2)	7.00 (2)
600 S.R. Olive Green	8.00 – 9.50	8.00 – 9.50
631 S.R.	12.00 (1)	12.00 (1)
Black Oil	4.00–5.50 (2)	4.00–5.50 (2)

SOUTH TEXAS Neutral Oils

Vis. Color		
Pale Oils: (*Vis. at 100°F*)		
100 No. 1½-2½	5.25 – 5.75	5.25 – 5.75
200 No. 2-3	7.25 – 7.75	7.25 – 7.75
300 No. 2-3	7.75 – 8.25	7.75 – 8.25
500 No. 2½-3½	8.50 – 9.00	8.50 – 9.00
750 No. 3-4	8.75 – 9.25	8.75 – 9.25
1200 No. 3-4	8.875– 9.375	8.875– 9.375
2000 No. 4	9.00 – 9.50	9.00 – 9.50
Red Oils:		
200 No. 5-6	7.25 – 7.75	7.25 – 7.75
300 No. 5-6	7.75 – 8.25	7.75 – 8.25
500 No. 5-6	8.50 – 9.00	8.50 – 9.00
750 No. 5-6	8.75 – 9.25	8.75 – 9.25
1200 No. 5-6	8.875– 9.375	8.875– 9.375
2000 No. 5-6	9.00 – 9.50	9.00 – 9.50

CHICAGO (From Mid-Continent p.l. crude)

Neutral Oils (Vis. at 100° F. 0 to 10 p.p.)

Pale Oils

Vis. Color		
60-85—No. 2	7.25	7.25
86-110—No. 2	7.25	7.25
150—No. 3	8.50	8.50
180—No. 3	9.50	9.50
200—No. 3	10.00	10.00
250—No. 3	11.00	11.00
Red Oils:		
180—No. 5	9.50	9.50
200—No. 5	9.50	9.50
250—No. 5	11.00	11.00
280—No. 5	12.00	12.00
300—No. 5	12.00	12.00

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower.

Unfiltered Steam Refined: (Viscosity at 210°)		
140	8.75	8.75
160	9.50	9.50
200	10.50	10.50
Bright stocks, 160 vis. at 210, No. 8 color:		
0 to 10 p.p.	15.50	15.50
15 to 25 p.p.	14.50	14.50
30 to 40 p.p.	13.95	13.95
E filtered Cyl. Stock	12.50	12.50

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

Natural Gasoline

(Group 3 & Breckenridge prices are to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

FOB GROUP 3		
Grade 26-70	(k)2.50	(k)2.25
FOB BRECKENRIDGE		
Grade 26-70	(i)2.00	(i) 1.75 – 2.00
CALIFORNIA (FOB plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	4.75 – 5.00	4.75 – 5.00

Naphtha and Solvent

Prices Effective	Sept. 30	Sept. 23
(FOB Group 3)		
Stoddard solvent	5.875	5.875
Cleaners' naphtha	6.375	6.375
V. M. & P. naphtha	6.375	6.375
Mineral spirits	5.375	5.375
Rubber solvent	6.375	6.375
Lacquer diluent	6.625– 7.375	6.625– 7.375
Benzol Diluent	7.875– 8.375	7.875– 8.375

Wax

White Crude Scale:

WESTERN PENNA. (Bbls., C.L., N. Y.)		
122-124 A.m.p.	2.50 – 2.75	2.50 – 2.75
124-126 A.m.p.	2.50 – 2.75	2.50 – 2.75
OKLAHOMA (Bbls. or burlap bags, C.L.)		
124-6 AMP	2.75 (1)	
131-3 AMP	2.75 (1)	2.75 (1)

CHICAGO (FOB Chicago district refinery of one refiner, in bags or slabs loose, carloads. Melting points are EMP (ASTM) methods; add 3° F. to convert into AMP.)

Fully refined:		
122-124 (bags only)	5.60	5.60
125-127	5.60	5.60
127-129	5.85	5.85
130-132	6.15	6.15
132-134	6.40	6.40
135-137	7.15	7.15

Petrolatums

WESTERN PENNA. (Bbls., carloads; tank cars, 0.5c per lb. less.)

Snow White	5.125– 6.125	5.125– 6.125
Lily White	4.375– 5.125	4.375– 5.125
Cream White	3.375– 4.125	3.375– 4.125
Light Amber	2.625– 3.00	2.625– 3.00
Amber	2.375– 2.875	2.375– 2.875
Red	2.125– 2.625	2.125– 2.625

Group 3 Freight Rates

To Division Headquarters Points of Standard Oil Co. of Indiana

	Gasoline-Kerosine		Distillate-Gas Oil-Fuel Oil	
	Cents per Cwt.	Cents per gal. 6.6 lbs.	Cents per Cwt.	Cents per gal. 7.4 lbs.
Chicago, Ill.	40	2.640	32	2.368
Decatur, Ill.	39	2.574	31	2.294
Joliet, Ill.	40	2.640	32	2.368
Peoria, Ill.	39	2.574	31	2.294
Quincy, Ill.	36	2.376	29	2.146
Indianapolis, Ind.	48	3.168	39	2.886
Evansville, Ind.	46	3.036	37	2.738
South Bend, Ind.	49	3.231	**42	**3.108
Detroit, Mich.	64	4.224	51	3.774
Grand Rapids, Mich.	61	4.026	50	3.700
Saginaw, Mich.	66	4.356	53	3.922
Green Bay, Wis.	51	3.366	41	3.034
Milwaukee, Wis.	43	2.838	34.5	2.553
LaCrosse, Wis.	46	3.036	37	2.738
Minneapolis-St. Paul	46	3.036	37	2.738
Duluth, Minn.	52	3.432	41.5	3.071
Mankato, Minn.	46	3.036	37	2.738
Des Moines, Ia.	36	2.376	29	2.146
Davenport, Ia.	39	2.574	31	2.294
Mason City, Ia.	42	2.772	33.5	2.479
St. Louis, Mo.	33	2.178	26.5	1.961
Kansas City, Mo.	28	1.848	22.5	1.665
St. Joseph, Mo.	28	1.848	22.5	1.665
Fargo, N. D.	63	4.158	50.5	3.737
Minot, N. D.	83	5.478	66.5	4.921
Huron, S. D.	53	3.498	42.5	3.145
Wichita				
From Ponca City	7.5	*0.495	7.5	†0.555
From Tulsa	12.5	*0.825	12.5	†0.925
From Cushing	11	*0.726	11	†0.814

*This rate also includes distillate rate at 6.6 lbs. per gal.

**This rate applies only to residual fuel and gas oil. Combination rate of 32c per cwt. at 7.4 Group 3 to Chicago, plus 9c per cwt. at 6.6, Chicago to South Bend, total of 2.962c per gal., applies to petroleum fuel oil distillate not suitable for illuminating purposes.

†This rate is exclusive of distillate which is based on 6.6 lbs. per gal. from Ponca City, Tulsa and Cushing, Okla., to Wichita. Includes only gas oil and fuel oil.

NOTE: There is no Group 3 rate to Wichita, Kans.

(f) Prices FOB Central Michigan refinery group basis for shipment within Michigan; shipments may originate at plants outside Central group. (g) Excluding Detroit shipment. (h) For shipment to Ark. points only. (i) Quotations. (j) Sale. (k) Sales. (l) Pittsburgh district prices excluded.

SEABOARD PRICES EXPORT AND COASTWISE

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

Atlantic Coast

(Prices are of refiners, FOB their refineries & their tanker terminals, & of tanker terminal operators, FOB their terminals)—Prices Effective Sept. 30

MOTOR GASOLINE

District:	Min. 80 Oct. '39 Research (Max. 2 cc. Lead)	72-74 Oct. (ASTM)	68-70 Oct. (ASTM)	65-66 Oct. (ASTM)	60-64 Oct. (ASTM)
N. Y. Harb.	5.75 (2)	5.00 – 6.50	5.00 – 5.50	5.00 – 5.75	5.75–6.00 (2)
N. Y. Harb., barges	5.75 – 7.00	4.75 – 6.50	4.75 – 5.25	4.75 – 5.75	5.75–6.00 (2)
Albany	5.70 (1)	5.30	.....	.....	.....
Philadelphia	5.75 – 7.00	5.25 – 7.00	5.25 – 6.75	5.70 (1)	5.50 – 6.75
Baltimore	5.75 – 7.25	5.50 – 7.25	5.50–6.00 (2)	5.50 (1)	5.50 – 6.50
Norfolk	5.75 – 7.25	5.50 – 7.25	5.75–6.00 (2)	5.75 (1)	5.75 (1)
Wilm'ton	6.25 – 7.05	6.00 – 7.05	5.75 – 6.375	5.75 (1)	5.75 – 6.50
Char'ston	6.25–7.05 (2)	6.00 – 7.05	5.75–6.50 (2)	5.75 (1)	5.75–6.50 (2)
Savannah	6.00–6.25 (2)	6.00 – 6.50	5.50 – 6.375	.....	5.75–6.00 (2)
Jacksonville	6.00–6.50 (2)	5.625– 6.50	5.75 – 6.25	.....	5.375–6.00
Miami	6.25–6.50 (1)	6.25 (1)	5.75–6.125 (2)	.....	5.00 (1)
Tampa	6.00–6.50 (2)	5.50 – 6.25	5.75–6.125 (2)	.....	5.375–5.75 (2)
Pensacola	6.25–6.50 (1)	.....	5.75–6.00 (1)	.....	.....
Mobile	6.25–6.50 (1)	5.75 (2)	5.75–6.00 (2)	.....	5.00–5.375 (2)
Portland	5.70 (2)	5.50	5.70 (1)	.....	.....
Boston	5.70 (2)	5.50	5.50 (1)	5.25 – 5.70	5.25 (2)
Providence	5.60 (2)	5.40 – 6.50	.....	5.60 (2)	5.15–6.00 (2)

FUEL OILS

	KEROSINE and or NO. 1 FUEL	No. 2	No. 3	No. 5	No. 6
N. Y. Harb.	4.80	4.10	4.10	$1.35 –$1.55	$1.15 –$1.25
N. Y. Harb., barges	4.70	(k)4.00	(k)4.00	.....	.....
Albany	4.90	4.20 (2)	4.20 (1)	$1.85 (1)	$1.45 (1)
Philadelphia	5.00 – 5.25	4.25	4.25	$1.37 –$1.47	$1.15 –$1.25
Baltimore	4.75	4.00	4.00	$1.37 (1)	$1.15 –$1.25
Norfolk	4.75 – 5.00	4.00 – 4.50	4.00 (2)	.....	$1.25 (2)
Wilmington	4.75 – 5.25	4.00	.....	.....	.....
Charleston	4.75 – 5.00	4.00 (2)	.....	.....	$1.20 (2)
Savannah	5.00 – 5.25	.....	.....	.....	$1.20 (1)
Jacksonville	5.00 – 5.25	4.25 (1)	4.25 (1)	.....	$1.20 (1)
Miami	5.125–5.25 (2)	.....	.....	.....	.....
Tampa	5.00 – 5.25	4.25 (1)	.....	.....	$1.15 (1)
Pensacola	5.125–5.25 (1)	.....	.....	.....	.....
Mobile	4.75 – 5.00	.....	.....	.....	.....
Portland	5.00	4.30	4.30	$1.85 (1)	$1.25 –$1.45
Boston	4.90	4.20	4.20	$1.58–$1.65 (2)	$1.25
Providence	4.90	4.20	4.20	$1.50 –$1.65	$1.25

	Bunker C Fuel Ships' bunkers (Ex Lighterage)	Diesel Oil Ships' bunkers (Ex Lighterage)	Diesel Oil Shore Plants	Gas House Gas Oil 28-34 Gravity
N. Y. harbor	$1.15 –$1.25	$1.70	4.10	4.20
Albany	$1.45 (1)	$1.80	4.20	.....
Philadelphia	$1.15 –$1.25	$1.70 –$1.95	.....	.....
Baltimore	$1.15 –$1.25	$1.70	4.00	4.00
Norfolk	$1.25	$1.68 –$1.70	4.00	4.00
Charleston	$1.20	$1.68 –$1.70	4.00	4.00
Savannah	$1.20 (1)	$1.785–$1.995	.....	.....
Jacksonville	$1.20	$1.785–$1.995	.....	.....
Tampa	$1.15	$1.785–$1.995	.....	.....
Portland	$1.25 –$1.45	$1.80	4.30	4.40
Boston	$1.25	$1.70	4.20	4.30
Providence	$1.25	$1.70	4.20	4.30

New York Export Lubes

(Penna. Products in bbls. FAS New York)

Prices Effective	Sept. 30	Sept. 23
Bright stock:		
Light, 25 p.t.	20.50 (1)	20.50 (1)
Neutral oil:		
200 3 color, 25 p.t.	.....	.....
150 3 color, 25 p.t.	25.50 (1)	25.50 (1)
600 s.r., unfilt.	16.00 (1)	16.00 (1)
650 s.r., unfilt.	17.00 (1)	17.00 (1)
600 fl. s.r.	18.00 (1)	18.00 (1)
630 fl., s.r.	20.00 (1)	20.00 (1)

Wax

(A.S.T.M. Tests. Melting points, however, are A.M.P., 3° higher than E.M.P. Export prices, FAS. c.l. Domestic prices, FOB. refr'ies., in bags, c.l., with 0.2c discount allowed for shipment in bulk, except where noted. Scale solid; fully refined slabs in bags)

Prices Effective Sept. 30

	New Orleans Export	N. Y. Domestic	N. Y. Export
Crude Scale:			
124-6 Yellow	2.50(1)	.....	2.50(1)
122-4 White	.....	2.50–2.75	2.50–2.75
124-6 White	2.50(1)	2.50–2.75	2.50–2.75
Fully Refined:			
123-5	.....	5.60	5.60(2)
125-7	5.60(1)	5.60	5.60
128-30	6.15(1)	5.60–5.70(i)	5.60
130-2	6.15(1)	5.85(i)	5.85
133-5	6.40(1)	6.15(i)	6.15
135-7	7.15(1)	6.40(i)	6.40
108-11 White Match	....	....	3.00(l&j)

Naphtha

Prices Effective Sept. 30	V.M.&P. Naphtha	Mineral Spirits
Baltimore	9.50	8.00
New York Harbor	8.80 – 9.50	8.20 – 8.50
Philadelphia district	10.00	8.00 – 9.00
Boston	9.50	9.25 – 9.50
Providence	9.50	9.00 – 9.50
†Ohio points, delivered	8.75	*8.25

*This is on rubber solvent.

†Ohio prices are those of S. O. Ohio. Its prices for D.C. naphtha, special Varnolene, Varnolene and Sohio Solvent are same as for V.M.&P.

Pacific Export

(Quotations at seaboard, Los Angeles, cargo lots, except where otherwise noted.)

Prices Effective	Sept. 30	Sept. 23
375 e.p. blend, 70 oct.	4.50 – 5.625	4.50 – 5.625
390 e.p. blend, 68 oct.	4.375– 5.50	4.375– 5.50
390 e.p. blend, 66 oct.	4.375– 5.375	4.375– 5.375
400 e.p. blend, 65 oct. min.	4.25 – 5.25	4.25 – 5.25
U. S. Motor, under 65 octane	4.25 – 5.125	4.25 – 5.125
38-40 grav. w.w. kero., 150 fire point	4.50 – 5.00	4.50 – 5.00
41-43 grav., w.w. kero.	4.75 – 5.00	4.75 – 5.00
44 grav., w.w. kero.	5.00 – 5.50	5.00 – 5.50
Diesel fuel, 24 & above	$1.25 –$1.30	$1.25 –$1.30
Diesel fuel, under 24	$1.15 –$1.25	$1.15 –$1.25
30-34 grav. diesel (gas oil) Pac. Spec. 200	$1.25 –$1.35	$1.25 –$1.35
Grade C fuel, Pac. Spec. 400	$0.60 –$0.65	$0.60 –$0.65
In Ships' Bunkers, or deep tank lots:		
Diesel fuel, Pac. Spec. 200	$1.35 –$1.45	$1.35 –$1.45
Grade C fuel, Pac. Spec. 400	$0.70 –$0.75	$0.85 –$0.90

Pacific Export (Cont'd)

Prices Effective	Sept. 30	Sept. 23
Cased Goods: (Per case)		
U. S. M.	$1.45 –$1.55	$1.45 –$1.55
375-400 e.p. blend, 65 oct. & above	$1.60 –$1.70	$1.60 –$1.70
400 e.p. blend, under 65 oct.	$1.50 –$1.60	$1.50 –$1.60
40-43 grav. w.w. kero., 150 fire point	$1.40 –$1.50	$1.40 –$1.50
Kero., p.w.	$1.30 –$1.45	$1.30 –$1.45

Tanker Rates

(Approximate rates. Cents per bbl.)

Gulf-N. Atlantic: (not E. of N.Y.)	Last Paid	Owners Ask
Hvy. Crude & fuel, (10 to 19.9 gravity)	21	23-24
Light Crude, (30 grav. or Lighter)	19	21-22
Gasoline	21	22-23
Kerosine	22	23-24
No. 2 Fuel	23	24-25

Gulf Coast

(Prices for sales made or firm offers reliably reported for sales pending in cargoes FOB ship at Gulf, for minimum of 20,000 bbls. Prices are by refiners only to other refiners, export agents, or to large tanker terminal operators at the customary trade specifications noted.)

Prices Effective Sept. 30

Motor Gasoline Domestic	
Min. 80 oct., '39 Research, max. 2 cc. lead	4.00 – 5.00
60-62, Gravity, Max. 400 e.p.	
72-74 oct. leaded (ASTM)	3.625– 4.75
70 oct. unleaded (ASTM)	4.25 – 4.75
68 oct. unleaded (ASTM)	3.75 – 4.75
65 oct. unleaded (ASTM)	3.625– 4.625
60 oct. unleaded (ASTM)	3.625– 4.50
41-43 w.w. kerosine	4.00 – 4.125
No. 2 fuel	3.25 – 3.625
Gas Oil—Less than ½ of 1% sulfur	
Below 43 diesel index	3.125– 3.375
43-47 diesel index	3.125– 3.375
48-52 diesel index	3.125– 3.625
53-57 diesel index	3.50 – 3.75
58 & above diesel index	3.75 – 4.125
Diesel Oil, ships' bunkers (ex-lighterage)	$1.50–$1.70
Bunker C, ships' bunkers (ex-lighterage)	$0.80–$0.90
Bunker C, cargoes	$0.80–$0.90

Motor Gasoline Export	
60-62 Gravity, Max. 400 e.p.	
72-74 oct. leaded (ASTM)	3.625– 4.75
70 oct. unleaded (ASTM)	4.25 – 4.75
68 oct. unleaded (ASTM)	3.75 – 4.75
65 oct. unleaded (ASTM)	3.625– 4.625
60 oct. unleaded (ASTM)	3.625– 4.50
61-63 Gravity, Max. 390 e.p.	
72-74 oct. leaded (ASTM)	4.25
60 oct. unleaded (ASTM)	4.00
64-66 Gravity, Max. 375 e.p.	
72-74 oct. leaded (ASTM)	4.25
60 oct. unleaded (ASTM)	4.00
41-43 w.w. kerosine	4.00 – 4.125
Gas Oil—Less than ½ of 1% sulfur	
Below 43 diesel index	3.125– 3.375
43-47 diesel index	3.125– 3.375
48-52 diesel index	3.125– 3.625
53-57 diesel index	3.50 – 3.75
58 & above diesel index	3.75 – 4.125

MID-CONTINENT LUBES

(At Gulf; in packages, FAS.; in bulk FOB terminals)

	Sept. 30 New Steel Drums	Bulk
200 vis. D. 210 brt. stock	25.50–25.80 (2)	19.80 (2)
150 vis. D 210 brt. stock 0-10 p.p.	21.50–21.80 (2)	15.80 (2)
10-25 p.p.	21.00 (1)	15.30 (1)
100 vis. D 210 brt. stock 0-10 p.p.	21.00 (1)	15.30 (1)
10-25 p.p.	20.50 (1)	14.80 (1)
200 vis. No. 3 col. neutral: 0-10 p.p.	17.00 (1)	11.30 (1)

SOUTH TEXAS LUBES

(Vis. at 100°, c. t. 0, blk. exprt. shp., FOB terminals)

Unfiltered Pale Oils: Vis. Color	Sept. 30	Sept. 23
100 No. 3	6.00 – 6.50	6.00 – 6.50
200 No. 3	7.50 – 8.50	7.50 – 8.50
300 No. 3	8.00 – 9.00	8.00 – 9.00
500 No. 3½	9.00 –10.50	9.00 –10.50
750 No. 4	9.50 –11.00	9.50 –11.00
1200 No. 4	10.00 –13.50	10.00 –13.50
2000 No. 4	10.25	10.25
Red Oils:		
Vis. Color		
100 No. 5-6	6.00 – 6.50	6.00 – 6.50
200 No. 5-6	7.50 – 8.50	7.50 – 8.50
300 No. 5-6	8.00 – 9.00	8.00 – 9.00
500 No. 5-6	9.00 –10.50	9.00 –10.50
750 No. 5-6	9.50 –11.00	9.50 –11.00
1200 No. 5-6	10.00 –13.50	10.00 –13.50
2000 No. 5-6	10.25	10.25

(i) Shipment in bags or in bulk. (j) Shipment in tight barrels. (k) Some oil said to be of Mexican origin is being offered at 3.875c.

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1.5c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes where levied are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for Feb. 21, 1940. These prices in effect Sept. 30, 1940 as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Esso (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
*Atlantic City, N. J.	6.5	8.1	4.5	7.4
*Newark, N. J.	6.5	8.1	4.5	7.4
Annapolis, Md.	7.85	8.85	5.5	9.5
Baltimore, Md.	7.25	8.25	5.5	8.5
Cumberland, Md.	8.65	9.65	5.5	10
Washington, D. C.	7.5	8.5	3.5	9.5
Danville, Va.	8.45	10.95	6.5	11
Norfolk, Va.	7.25	9.75	6.5	10.5
Petersburg, Va.	7.55	10.05	6.5	11.2
Richmond, Va.	7.55	10.05	6.5	10.5
Roanoke, Va.	8.75	11.25	6.5	11
Charleston, W. Va.	8.05	10.55	6.5	12.6
Parkersburg, W. Va.	7.35	9.85	6.5	11.2
Wheeling, W. Va.	8.35	10.75	6.5	11.8
Charlotte, N. C.	9.4	9.5	7.5	11.8
Hickory, N. C.	9.95	11.45	7.5	12.3
Mt. Airy, N. C.	9.8	11.3	7.5	12.2
Raleigh, N. C.	9.15	9	7.5	11.5
Salisbury, N. C.	9.45	8.50	7.5	11.9
Charleston, S. C.	7.25	9.75	7.5	9.25
Columbia, S. C.	8.1	10.6	7.5	11.5
Spartanburg, S. C.	8.8	11.3	7.5	12.2

	Mineral Spirits T.W.	V.M.&P. T.W.
Newark, N. J.	11.5	15.5
Baltimore, Md.	15.5	....
Washington, D. C.	15	....

Fuel Oils—T.W.	No. 1	No. 2	No. 3
Atlantic City, N. J.	7.4	6.1	6.1
Newark	7.4	6.1	6.1
Annapolis, Md.	....	6	....
Baltimore	6.75	6	5.5
Washington, D. C.	7	6.25	6.25
Norfolk, Va.	7	6	6
Petersburg	7.25	6.25	....
Richmond	7.25	6.25	6.25
Charlotte, N. C.	8.5	7.25	....
Hickory	....	7.5	....
Raleigh	8.5	7	....
Charleston, S. C.	8	6.5	....
Columbia	8.7	7.2	....
Spartanburg	9.8	8.3	....

*Effective Sept. 19, 1940, minimum retail resale price of 10.4c posted thru New Jersey.

Discounts:

Esso gasoline—to undivided dealers, 0.5c off dealer t.w. price, thru territory, except New Jersey. While above posted prices continue at Atlantic City and Newark, dealers will pay net price of 7.5c per gal. for Esso: dealers having pumps marked only Esso, Esso Extra and Standard White gasoline will pay 7c per gal. for Esso.

Kerosine—1c off t.w. price for 25 gals. or more, under contract thru territory (Baltimore city contract not necessary) except no discount in state of New Jersey.

Naphthas—To buyers taking following quantities at one time: Newark, 2c per gal. on 200 gals. or more, less than 200 gals. 0.5c higher price; Baltimore; 2c off on 25 to 100 gals. and 3c on over 100 gals.; Washington, 2c off to contract buyers.

Socony-Vacuum Oil Co., Inc.

Socony Mobilgas (*Regular Grade*)††

	Com. T.C.	Com. Cons. T.W.	Div. Dlr. T.W.	Gaso-line Taxes	Kero-sine T.W.
New York City:					
Manhattan & Bronx	6.2	6.0	7.2	*5.5	7.6
Kings & Queens	6.3	6.3	7	*5.5	7.6
Richmond	6.2	6	7	*5.5	7.6
Albany, N. Y.	6	6	7	5.5	7.3
Binghamton, N. Y.	7.8	7.8	8.8	5.5	9.1
Buffalo, N. Y.	6.8	6.9	7.9	5.5	7.5
Jamestown, N. Y.	6.7	6.7	7.7	5.5	7.4
Plattsburg, N. Y.	6.4	7.1	8.1	5.5	7.9
Rochester, N. Y.	6.5	7.3	8.3	5.5	8.1
Syracuse, N. Y.	6.4	7	6.2	5.5	8.2
Bridgeport, Conn.	6.1	6.5	6	4.5	7.5
Danbury, Conn.	6.6	6.6	7.6	4.5	8
Hartford, Conn.	6.3	6.6	7	4.5	7.5
New Haven, Conn.	6.1	6.2	6.5	4.5	7
Bangor, Me.	5.9	6.9	5.8	5.5	7.8
Portland, Me.	5.5	6.5	6.2	5.5	7.4
Boston, Mass.	5.5	6.5	6.5	4.5	7.7
Concord, N. H.	6.3	6.5	7.5	5.5	8.3
Lancaster, N. H.	7.5	8.3	9.3	5.5	9.3
Manchester, N. H.	6.6	7.2	7	5.5	8.5
Providence, R. I.	5.4	5.9	6.9	4.5	7.7
Burlington, Vt.	6.7	7.1	6.8	5.5	7.9
Rutland, Vt.	6.7	7.2	8.2	5.5	8.3

	Mineral Spirits T.W.	V.M.&P. T.W.
Buffalo, N. Y.	9.4	10.1
New York City	8.2	8.8
Rochester, N. Y.	10.2	10.9
Syracuse, N. Y.	11.1	11.8
Boston, Mass.	11	11
Bridgeport, Conn.	11.5	12
Hartford, Conn.	11	11.5
Providence, R. I.	11	12

Fuel Oils—T.W.	Mobilheat & Mobilheat Heavy
New York City	6
Albany, N. Y.	6.1
Rochester, N. Y.	6.4
Boston, Mass.	6.1
Bangor, Me.	6.6
Manchester, N. H.	6.9
Burlington, Vt.	6.8
Hartford, Conn.	6.3
New Haven, Conn.	6.3
Providence, R. I.	6.1

*Plus 2% city sales tax computed at time of each sale.

†Prices apply to consumers only in quantities over 1000 gals. annually; for quantities under 1000 gals. annually, add 0.5c per gal.

††Same prices apply for No. 1 fuel.

Discounts: Gasoline—To undivided dealers, 0.5c less than divided dealer t.w.

Atlantic Refining

Atlantic White Flash Gasoline (*Regular Grade*)

	Commercial T.C.	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
Philadelphia, Pa.	7	8	5.5	10
Pittsburgh	7.5	9.5	5.5	10.5
Allentown	7.5	9	5.5	10.5
Erie	7	9.5	5.5	10
Scranton	7	8.75	5.5	10.5
Altoona	7.5	9.5	5.5	10.5
Emporium	7.5	9.5	5.5	10.5
Indiana	7.5	9.5	5.5	10.5
Uniontown	7.5	9.5	5.5	10.5
Harrisburg	7.5	9	5.5	10.5
Williamsport	7.5	9	5.5	10
Dover, Del.	....	8.5	5.5	10.5
Wilmington	....	8	5.5	10
Boston, Mass.	....	6.5	4.5	7.7
Springfield, Mass.	....	6.5	4.5	8.4
Worcester, Mass.	....	7	4.5	7.8
Fall River, Mass.	....	7.1	4.5	7.9
Hartford, Conn.	....	7	4.5	7.9
New Haven, Conn.	....	6.5	4.5	7.9
Providence, R. I.	....	7.1	4.5	7.9
Atlantic City, N. J.	....	7.5	4.5	7.4
Camden, N. J.	....	7.5	4.5	7.4
Trenton, N. J.	....	7.3	4.5	7.4
Annapolis, Md.	....	8.85	5.5	9.5
Baltimore, Md.	....	8.25	5.5	8.5
Hagerstown, Md.	....	9.35	5.5	10
Richmond, Va.	....	10.05	6.5	10.5
Wilmington, N. C.	....	9.85	7.5	10.8
Brunswick, Ga.	....	8	7.5	*9
Jacksonville, Fla.	....	6.5	8.5	10

	Mineral Spirits T.W.†	V.M.&P. T.W.†
Philadelphia, Pa.	12	14.5
Lancaster, Pa.	13.5	16
Pittsburgh, Pa.	14.5	14.5

Fuel Oils—T.W.	1	2	3	5	6
Phila., Pa.	8	6.25	6.25	4.25	3.50
Allentown, Pa.	8.5	6.25	6.25	....	....
Wilmington, Del.	8.00	6.25	6.25	....	....
Springfield, Mass.	8.4	6.5	6.5	....	....
Worcester, Mass.	7.8	6.4	6.4	....	....
Hartford, Conn.	7.9	6.3	6.3	....	....

*Does not include 1c Georgia kerosine tax.

†Mineral Spirits prices also apply to Stoddard Solvent; V.M.&P. prices also apply to Light Cleaners Naphtha.

Discounts:

Gasoline—to undivided dealers, 0.5c off dealer t.w., except Georgia & Florida dealer t.w. and undivided dealer t.w. prices are same. At Scranton, Pa., 1c per gal. voluntary discount allowed to dealers only.

Kerosine—Thru Penna. & Delaware, 2c off t.w. price on t.w. deliveries of 25 gals. or more at one time.

Naphthas—Philadelphia, 200 gals. or more at one time, 2c off. Lancaster, contract buyers taking 1000 gals. or more per year, one drum up, 2c off; non-contract buyers, 200 gals. or more at one time, 2c off. Pittsburgh, 500 gals. or more at one time, 2c off.

S. O. Ohio††

	*Sohio X-70 Gasoline (*Regular Grade*) Consumer T.W.	**Re-sellers	‡S.S.	Gaso-line Taxes	†Kero-sine T.W.
Ohio, Statewide	10.5	9	12.5	5.5	8
Akron	10.5	7.5	9.5	5.5	8
Cincinnati	10.5	7.5	10	5.5	8
Cleveland	10.5	8	11	5.5	8
Columbus	10.5	8	11	5.5	8
Dayton	10.5	7.5	10	5.5	8
Marietta	10.5	8.5	11	5.5	8
Portsmouth	10.5	9	12.5	5.5	8
Toledo	10.5	7.5	10	5.5	8
Youngstown	10.5	8	11	5.5	7.5

Esso Aviation Gasoline—Thru Ohio

	Consumer T.W.	Gasoline Taxes
74 octane	15.5	5.5
80 octane	16.5	5.5
87 octane	17.5	5.5

†Naphthas — Statewide	T.W.
S.R. Solvent	12.75
D.C. Naphtha	13.25
V.M.&P. Naphtha	13.25
Varnolene	13.25
Sohio Solvent	13.25

Fuel Oils—T.W.	No. 1	No. 2	No. 3	No. 4
Ohio, Statewide	8.0	8.0	7.5	....
Toledo	7.5	7.5	7.0	....
Cleveland	9.5	9.5	9.0	6.75

*Renown (third-grade) prices are same as X-70 unless otherwise noted.

**Except authorized agents.

†Kerosine prices are ex 1c state tax. Naphtha prices are ex 1.5c federal & 4c state tax.

‡Prices at company-operated stations.

††Statewide prices are subject to exceptions other than those shown.

Discounts:

Esso aviation—on contract to hangar operators and resellers, 2c off consumer t.w.

Fuel Oils—Statewide and Toledo prices are for t.w. deliveries of less than 50 gals.; t.w. and drum deliveries of over 50 gals. are 0.5c less. Cleveland Nos. 1, 2, and 3 prices are for bulk deliveries of 5 to 99 gals.; 100 gals. and over are 2c less. Cleveland No. 4 price is for full compartment hose dump only.

Naphthas—to contract consumers off t.w. prices; 300 to 999 gals., 0.5c; 1000 to 2499 gals., 0.75c; 2500 to 4999 gals., 1c; 5000 or more gals., 1.5c.

S. O. Kentucky

Crown Gasoline (*Regular*)
Standard (*Third Grade*)

	†Net Dealer Crown	Standard	Gaso-line Taxes	Kero-sine T.W.
Covington, Ky.	7	6.5	6.5	9
Lexington, Ky.	9	7	6.5	9
Louisville, Ky.	8.5	6.5	6.5	8.5
Paducah, Ky.	7.5	7	6.5	8.5
Jackson, Miss.	8.5	7.5	7.5	*8.5
Vicksburg, Miss.	8.5	7.5	7.5	*8
Birmingham, Ala.	9	8	*8.5	9
Mobile, Ala.	6	5	*9.5	8
Montgomery, Ala.	9	7.5	*9.5	*9
Atlanta, Ga.	8.5	7	7.5	*7
Augusta, Ga.	9.5	8.5	7.5	*8.5
Macon, Ga.	8.5	7.5	7.5	*8
Savannah, Ga.	8.5	7.5	7.5	*8
Jacksonville, Fla.	6.5	6	8.5	8
Miami, Fla.	7	6.5	8.5	8
Pensacola, Fla.	8	7	*9.5	8
Tampa, Fla.	6.5	6	8.5	8

*Taxes: In tax column are included these city and county gasoline taxes: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have 1c kerosine tax, Mississippi 0.5c, not included in above prices.

†Consumer t.w. prices are same as net dealer prices.

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Red Crown Cons. T.W.	Dealer Prices Red Crown	Stano-lind	Gaso-line Taxes	Kero-sine T.W.
Chicago, Ill.	11.1	9.1	6.4	4.5	10
Decatur, Ill.	10.1	8.6	7	4.5	9.5
Joliet, Ill.	11.1	9.6	6.7	4.5	10
Peoria, Ill.	11.1	8.7	8.1	4.5	10
Quincy, Ill.	10.9	9.4	6.2	4.5	9.8
Indianapolis, Ind.	11.3	9.3	8.9	5.5	*10
Evansville, Ind.	11.1	9.6	8	5.5	*9.8
South Bend, Ind.	11.3	9.8	8.3	5.5	*10
Detroit, Mich.	9.6	8.1	7.1	4.5	7.6
Grand Rapids, Mich.	8.7	6.7	6.7	4.5	9
Saginaw, Mich.	10.4	8.9	8.4	4.5	9.1
Green Bay, Wis.	11.9	10.4	8.9	5.5	10.3
Milwaukee, Wis.	11.3	9.8	9.3	5.5	10.2
La Crosse, Wis.	11.5	10	9.5	5.5	10.4
Minneapolis-St. Paul.	11.5	9.7	7.3	4.5	10.4
Duluth, Minn.	11.9	10.4	9.9	4.5	10.8
Mankato, Minn.	11.5	10	8.5	4.5	9
Des Moines, Ia.	10.9	9.4	7.9	4.5	*9.8
Davenport, Ia.	11.1	9.6	8.1	4.5	*10
Mason City, Ia.	11.3	9.8	7.4	4.5	*10.2
St. Louis, Mo.	10.7	8.7	7	*4.5	9
Kansas City, Mo.	10.3	8.8	6.9	*4.5	8
St. Joseph, Mo.	10.4	8.5	7.5	*4.5	7.9
Fargo, N. D.	12.7	11.2	9.3	5.5	11.6
Huron, S. D.	12	10.5	10	5.5	10.9
Wichita, Kans.	9.3	7.8	5.5	4.5	7

(Continued on next page)

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1.5c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes where levied, are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NP N for Feb. 21, 1940.*

These prices in effect Sept. 30, 1940 as posted by principal marketing companies at their headquarters offices, but subject to later correction.

S. O. Indiana (Cont'd)

Stanavo Aviation 73 Octane

Chicago, Ill.	14.9	
Detroit, Mich.	16.5	4.5
Milwaukee, Wis.	15.1	5.5
Minneapolis, Minn.	15.3	4.5
St. Louis, Mo.	14.5	3.5
Kansas City, Mo.	14.2	*4.5
Fargo, N. D.	16.5	5.5
Huron, S. D.	15.8	5.5

	Oleum Spirits	V.M.&P. Naphtha	Stanisol	*Taxes
	(Prices are base prices before discounts)			
Chicago	12.7	13	12.4	4.5
Detroit	15.2	14.2	15.7	4.5
K. C., Mo.	12.9	13.9	13.4	1.5
St. Louis	13.2	14.2	12.4	1.5
Milwaukee	13.8	14.8	14.3	5.5
Minneap'lis	14	15	12.7	4.5

†Fuel Oils—T.W.	No. 1 Fuel	Stanolex Furnace
Chicago	**6.50	6.50
Indianapolis	....	*7.5
Detroit		6.6
Milwaukee	8.2	7.7
Minneapolis	7.5	7.5
St. Louis	7.0	6.50
Kansas City	6.8	6.8

*Taxes: In gasoline tax column are included these city taxes—Kansas City, St. Joseph, and St. Louis, 1c. Indiana kerosine and fuel oil prices are ex 4c state tax; Iowa kerosine prices are ex 3c state tax. In naphtha tax column are included 1c federal tax and state taxes.

†Prices for small-lot deliveries range up to 2c higher than above prices.

**For 400 gals. & over; 150 to 399 gals., 7c; 100 to 149 gals., 7.5c; 1 to 99 gals., 8.5c.

S. O. Nebraska

Standard Red Crown Gasoline (*Regular Grade*)

	T.W.	Dealer	Gasoline Taxes	Kerosine T.W.
Omaha	10.9	9.4	6.5	9.5
McCook	11	9.2	6.5	9.9
Norfolk	11	8.9	6.5	9.9
North Platte	11.3	9	6.5	10.2
Scottsbluff	11.9	9.5	6.5	10.8

S. O. Louisiana

Esso (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Little Rock, Ark.	7.25	8.5	8	10
Alexandria, La.	6.75	9.25	8.5	*9.5
Baton Rouge, La.	6.75	9.25	8.5	*9.5
New Orleans, La.	5.75	8.25	8.5	*9
Lake Charles, La.	6.75	9.25	8.5	*9
Shreveport, La.	5.5	8	8.5	*8
Lafayette, La.	7	9.5	8.5	*9
Bristol, Tenn.	10.25	10.25	8.5	12
Chattanooga, Tenn.	9.5	7.25	8.5	12
Knoxville, Tenn.	10	11.5	8.5	12.5
Memphis, Tenn.	8	9.5	8.5	11
Nashville, Tenn.	9	8	8.5	11

*New Orleans kerosine price is ex 1c parish tax, and all Louisiana kerosine prices are ex 1c state tax.

Discounts:

Esso gasoline—to undivided dealers, 0.5c off dealer t.w.

Humble Oil & Refining Co.

Humble Motor Fuel (*Regular Grade*)

	Tank Truck	Retail	Gasoline Taxes	Kerosine T.W
Dallas, Tex.	6	10	5.5	6
Ft. Worth, Tex.	6	10	5.5	7
Houston, Tex.	7	11	5.5	8
San Antonio, Tex.	7	11	5.5	8

Thriftane

(Leaded, 67 Octane, Purple Gasoline)

Dallas	5	8	5.5
Ft. Worth	5	8	5.5
Houston	5	8	5.5
San Antonio	5	8	5.5

74 Octane Aviation Gasoline, Clear

	Tank Car
FOB Baytown, Tex.	8.5

*To all classes of dealers & consumers.

The Texas Co.

	Gasoline—Dealer T.W. Fire-Chief (*Regular*)	Indian (*3rd Grade*)	Gasoline Taxes
Dallas, Tex.	7	6	5.5
Ft. Worth, Tex.	7	6	5.5
Wichita Falls, Tex.	8	6	5.5
Amarillo, Tex.	8	6	5.5
Tyler, Tex.	8	6	5.5
El Paso, Tex.	8	7	5.5
San Angelo, Tex.	8	6	5.5
Waco, Tex.	7.5	5.5	5.5
Austin, Tex.	7	5	5.5
Houston, Tex.	7	5	5.5
San Antonio, Tex.	7	5	5.5
Port Arthur, Tex.	7	5	5.5

Continental Oil

	Conoco Bronz-z-z (*Regular*)	Demand (*3rd Grade*)	Gasoline Taxes	Kerosine T.W.
	T.W.			
Denver, Col.	8	7	5.5	10.5
Grand Junction, Col.	11	10	5.5	12.5
Pueblo, Col.	10	8	5.5	9
Casper, Wyo.	11	10	5.5	11.5
Cheyenne, Wyo.	9	8	5.5	11
Billings, Mont.	11	10	6.5	12
Butte, Mont.	9	8	6.5	13
Great Falls, Mont.	11	9	6.5	12
Helena, Mont.	9	8	6.5	12.5
Salt Lake City, Utah	10.5	9.5	5.5	14
Boise, Ida.	*12.1	11.1	6.5	16
Twin Falls, Ida.	*15.1	*14.1	6.5	16.5
Albuquerque, N. M.	9	8	*7	9.5
Roswell, N. M.	7	6	*7	8
Santa Fe, N. M.	9.5	8.5	*7.5	9.5
Ft. Smith, Ark.	8	6.25	5.5	6.5
Little Rock, Ark.	8	5.5	8	8
Texarkana, Ark.	8	6	5.5	6
Muskogee, Okla.	8	7	5.5	7
Oklahoma City, Okla.	6	5.5	5.5	6.5
Tulsa, Okla.	7	6	5.5	6

Conoco Special Gasoline (Aviation)

	T.W.	Gasoline Taxes
Denver, Colo.	15	5.5
Cheyenne, Wyo.	15.5	5.5
Helena, Mont.	22.5	6.5
Salt Lake City, Utah	18	5.5
Albuquerque, N. M.	14	*7

*Taxes: In gasoline tax column are included these city taxes—Albuquerque and Roswell, 0.5c; Santa Fe 1c. Idaho prices include 0.1c to cover 1-mill tax for toll bridges.

S. O. California

Standard Gasoline (*Regular Grade*)

	Tank Truck	Retail	Gasoline Taxes	Kerosine T.W.
San Francisco, Cal.	12	13	4.5	11.5
Los Angeles, Cal.	11.5	12.5	4.5	10
Fresno, Cal.	13	14	4.5	12.5
Phoenix, Ariz.	14	15	6.5	*12.5
Reno, Nev.	14	15	5.5	13.5
Portland, Ore.	12.5	13.5	6.5	13.5
Seattle, Wash.	12.5	13.5	6.5	13.5
Spokane, Wash.	14	15	6.5	16.5
Tacoma, Wash.	12.5	13.5	6.5	13.5

Flight Gasoline (*Third Grade*)

San Francisco, Cal.	10	11	4.5	....
Los Angeles, Cal.	9.5	10.5	4.5	....
Fresno, Cal.	11	12	4.5	....
Reno, Nev.	12	13	5.5	....
Phoenix, Ariz.	11	12	6.5	....
Portland, Ore.	10.5	11.5	6.5	....
Seattle, Wash.	10.5	11.5	6.5	....
Spokane, Wash.	12	13	6.5	....
Tacoma, Wash.	10.5	11.5	6.5	....

Stanavo Aviation Gasoline

Phoenix, Ariz.	17.5	..	6.5	....
Los Angeles, Cal.	15	..	4.5	....
San Francisco, Cal.	15.5	..	4.5	....
Reno, Nev.	17.5	..	5.5	....
Portland, Ore.	16	..	6.5	....
Seattle, Wash.	16	..	6.5	....
Spokane, Wash.	19	..	6.5	....

*Taxes: Arizona kerosine prices are ex 5c state tax.

Discounts:

To 100% dealers—3c off t.w. on Standard and Stanavo Aviation; 2c off t.w. on Flight.

Canada

PRICES OF IMPERIAL OIL LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline

	(*Regular Grade*) T.W.	Gasoline Taxes	Kerosine T.W.
Hamilton, Ont.	16.5	8	17
Toronto, Ont.	16.5	8	17
Brandon, Man.	21	7	22.50
Winnipeg, Man.	20.5	7	22.5
Regina, Sask.	18	7	20
Saskatoon, Sask.	21	7	23
Edmonton, Alta.	18	7	20
Calgary, Alta.	16	7	18
Vancouver, B. C.	16	7	23
Montreal, Que.	16	8	16.5
St. John, N. B.	14.50	10	18
Halifax, N. S.	14.50	10	18

Discounts: Gasoline—Maritime Provinces—undivided & divided dealers, t.w. price; British Columbia—undivided and divided dealers, 2c off t.w. price; balance of territory—undivided dealers, 1c off t.w. price, divided dealers, t.w. price.

Price Changes

(These changes have been made in price tables)

S. O. New Jersey—Esso:

Correction—Atlantic City and Newark dealer t. w. cut of 0.6c, Sept. 19, shown in Sept. 25th issue was in error.

Socony-Vacuum—Mobilgas:

Commercial t. c. price cuts ranging from 0.1c to 1.1c throughout territory, except Kings & Queens, Lancaster and Manchester, effective Sept. 25.

Commercial consumer t. w. price cuts ranging from 0.2c to 1c throughout territory, except Boston which advanced 0.3c and Kings and Queens which remained unchanged, effective Sept. 25.

Divided dealer t. w. price cuts ranging from 0.1c to 1.7c throughout territory, except Binghamton which advanced 0.9c and Kings & Queens, Albany, Bridgeport, Hartford, New Haven, Boston and Manchester which remained unchanged, effective Sept. 25.

Socony-Vacuum—Kerosine:

Danbury t. w. cut 0.2c, Sept. 10.

Atlantic Refining—White Flash:

Springfield dealer t. w. cut 0.4c, Sept. 19.
Worcester dealer t. w. cut 0.2c, Sept. 25.
New Haven dealer t. w. up 1c, Sept. 20.

S. O. Kentucky—Crown:

Covington cut 1c, Sept. 20.
Lexington up 1c, Sept. 16.
Atlanta up 1c, Sept. 19.
Macon up 2c, Sept. 16; cut 1c, Sept. 21.

S. O. Kentucky—Standard:

Covington cut 0.5c, Sept. 20.
Lexington up 1c, Sept. 16.
Macon up 1.5c, Sept. 16; cut 0.5c, Sept. 21.

S. O. Kentucky—Kerosine:

Covington, Lexington, Louisville, Paducah, Vicksburg, Augusta, and Pensacola t. w. cut 0.5c, Sept. 16.
Atlanta t. w. cut 2c, Sept. 21.

The Texas Co.—Fire-Chief and Indian:

Dallas, Ft. Worth, Wichita Falls, Amarillo, Tyler, San Angelo and Waco dealer t. w. up 1c, Sept. 25.

CRUDE OIL PRICES

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN & CENTRAL STATES FIELDS

PENNSYLVANIA GRADE

Posted by Jos. Seep Purch. Agency (Aug. 28, 1940)

Bradford-Allegany	$1.85
Southwest Penna.	$1.50
Eureka (West Va.)	$1.44
Corning, O. (Nov. 4, 1939)	$1.12

Posted by Tide Water Assoc. Oil Co. (Aug. 28, 1940)

Bradford-Allegany	$1.85

Posted by The Pennzoil Co. (Aug. 28, 1940)

National Transit	$1.78*

Posted by Valvoline Pipe Lines (Aug. 28, 1940)

Bradford (Elk & McKean Counties, Pa.)	$1.85
Warren, Forest, Venango, Clairon & Butler Counties, Pa.	$1.78
Allegheny, Beaver, Washington & Greene Counties, Pa.	$1.50
West Virginia	$1.44
South Eastern Ohio	$1.40

*Applies to Cochran, Franklin, Hamilton & Doolittle districts; prices in other lower districts range down to $1.73 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co. (Aug. 24, 1940)

Midland, Midland County	$1.12
Sherman	$1.07
Clare-Freeman	$1.07

Posted by Simrall Corp. (Aug. 24, 1940)

Crystal, Greendale, Porter, Vernon and Wise	$1.12
Beaverton, Buckeye, Bentley, Edenville	$1.10
Freeman and Redding	$1.07
Arenac	$0.92
West Branch	$0.92

Posted by Sohio Corp. (Michigan Division)

Allegan & Kent Counties (Aug. 24, 1940)	$1.18
Van Buren County (Sept. 3, 1940)	$1.12

Posted by Bay Pipe Line Corp. (Aug. 24, 1940)

Bentley and Buckeye	$1.10
Saginaw and Wise. $1.12 Clare	$0.81

ILLINOIS-INDIANA-KENTUCKY

Posted by Ohio Oil Co.

Illinois and Western Indiana (Aug. 23, 1940)	$1.00
Illinois Basin (Aug. 21, 1940)	$1.15

Posted by Sohio Corp.

Illinois Basin:	
Salem (Lake Centralia) (Aug. 21, 1940)	$1.15
Balance of Illinois Basin (Aug. 21, 1940)	$1.15
Griffin (So. Ill.-Ind.) pool (Aug. 21, 1940)	$1.15

Posted by Carter Oil Co. (Aug. 21, 1940)

Louden, Fayette County, Ill.	$1.15

Posted by Mohawk Oil Lines, Inc. (Aug. 21, 1940)

Southern Ill. heavy $1.05	Light $1.15

Posted by Ashland Oil & Transportation Co. (Aug. 21, 1940)

Somerset Oil in Ashland Lines, Kentucky:	
Big Sandy River $1.12	Kentucky River $1.20

Posted by Sohio Corp. (Aug. 21, 1940)

Birk City, Ky., area	$1.05
Corydon, Ky. Area (Henderson)	$1.05

Posted by Owensboro-Ashland Co.

Owensboro, Ky. Area (Aug. 21, 1940)	$1.10

CANADIAN FIELDS

Posted by Imperial Oil Limited Western Ontario (Nov. 6, 1939)

Petrolia $2.10	Oil Springs $2.17

Turner Valley Crude Oil (Prices FOB producer's tankage) (Sept. 12, 1940)

33-33.9	$1.08	44-44.9	$1.30	55-55.9	$1.52
34-34.9	1.10	45-45.9	1.32	56-56.9	1.54
35-35.9	1.12	46-46.9	1.34	57-57.9	1.56
36-36.9	1.14	47-47.9	1.36	58-58.9	1.58
37-37.9	1.16	48-48.9	1.38	59-59.9	1.60
38-38.9	1.18	49-49.9	1.40	60-60.9	1.62
39-39.9	1.20	50-50.9	1.42	61-61.9	1.64
40-40.9	1.22	51-51.9	1.44	62-62.9	1.66
41-41.9	1.24	52-52.9	1.46	63-63.9	1.68
42-42.9	1.26	53-53.9	1.48	64 & over	1.70
43-43.9	1.28	54-54.9	1.50		

Absorption Gasoline (Jan. 5, 1938)

90% Rec., 20 lb. Reid v.p.	$1.94
90% Rec., 17 lb. Reid v.p.	$2.08

*MID-CONTINENT—Oklahoma-Kansas

	S. O. Indiana	Carter Magnolia Shell	Continental Texas Co.	Sinclair Prairie
Below 21°	$0.70	$0.60	....	....
21-21.9	.72	.63	....	....
22-22.9	.74	.66	....	....
23-23.9	.76	.69	....	....
24-24.9	.78	.72	....	....
25-25.9	.80	.75	....	$0.58
26-26.9	.82	.78	....	.63
27-27.9	.84	.81	....	.68
28-28.9	.86	.84	$0.86	.73
29-29.9	.88	.87	.88	.78
30-30.9	.90	.90	.90	.82
31-31.9	.92	.92	.92	.86
32-32.9	.94	.94	.94	.90
33-33.9	.96	.96	.96	.96
34-34.9	.98	.98	.98	.98
35-35.9	1.00	1.00	1.00	1.00
36-36.9	1.02	1.02	1.02	1.02
37-37.9	1.04	1.04	1.04	1.04
38-38.9	1.06	1.06	1.06	1.06
39-39.9	1.08	1.08	1.08	1.08
40 & above	1.10	1.10	1.10	1.10

*Effective in 1938 by Carter Oil, Oct. 13, posting in Okla. only; Continental Oil, Oct. 11, with lowest grade below 29; Magnolia, Oct. 12, posting in Okla. only; Shell, Oct. 22; S. O. Indiana, Oct. 17; The Texas Co., Oct. 12. Aug. 31, 1939, by Sinclair-Prairie.

*North-North Central and Central Texas

Below 21°	$0.63	27-27.9	$0.77	34-34.9	$0.91
21-21.9	.65	28-28.9	.79	35-35.9	.93
22-22.9	.67	29-29.9	.81	36-36.9	.95
23-23.9	.69	30-30.9	.83	37-37.9	.97
24-24.9	.71	31-31.9	.85	38-38.9	.99
25-25.9	.73	32-32.9	.87	39-39.9	1.01
26-26.9	.75	33-33.9	.89	40 & above	1.03

*Effective Sept. 1, 1940 by Stanolind in N. Texas; Oct. 11, 1938 by Continental in N. Texas; Oct. 12, 1938 by Texas Co. in N. & N. Central Texas; Dec. 3, 1938 by Magnolia in N. & N. Central Texas; July 16, 1940 by Sinclair-Prairie in Mexia & N. Central Texas. Texas Co.'s lowest grade is 28-28.9, at $0.79. Postings by Sinclair, Continental and Magnolia begin with $0.79 for Below 29 gravity oil.

Jefferson County, Texas—Beaumont

(Posted by Magnolia Petroleum Co., Effective Oct. 2, 1939, and by Stanolind Oil & Gas Co., for West Beaumont, Effective Oct. 2, 1939)

Below 20°	$0.86	30-30.9	$1.08
20-20.9	.88	31-31.9	1.10
21-21.9	.90	32-32.9	1.12
22-22.9	.92	33-33.9	1.14
23-23.9	.94	34-34.9	1.16
24-24.9	.96	35-35.9	1.18
25-25.9	.98	36-36.9	1.20
26-26.9	1.00	37-37.9	1.22
27-27.9	1.02	38-38.9	1.24
28-28.9	1.04	39-39.9	1.26
29-29.9	1.06	40 & above	1.28

TEXAS FIELDS

Posted by Humble Oil & Refining Co.

***West Central Texas** (Aug. 11, 1939)

24-24.9	$0.71	33-33.9	$0.89
25-25.9	.73	34-34.9	.91
26-26.9	.75	35-35.9	.93
27-27.9	.77	36-36.9	.95
28-28.9	.79	37-37.9	.97
29-29.9	.81	38-38.9	.99
30-30.9	.83	39-39.9	1.01
31-31.9	.85	40 & above	1.03
32-32.9	.87		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young Counties.

Effective Aug. 29, 1939, Shell posted in Fisher county, Tex., prices 3c lower than Humble's West Central Texas prices; Shell's schedule begins with below 25, at $0.68 and ends with 40 & above, at $1.

Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60F.

***East Central Texas** (Aug. 11, 1939)

23-23.9	$0.78	32-32.9	$0.96
24-24.9	.80	33-33.9	.98
25-25.9	.82	34-34.9	1.00
26-26.9	.84	35-35.9	1.02
27-27.9	.86	36-36.9	1.04
28-28.9	.88	37-37.9	1.06
29-29.9	.90	38-38.9	1.08
30-30.9	.92	39-39.9	1.10
31-31.9	.94	40 and above	1.12

Posted by Pan American Pipe Line Co.
(Oct. 2, 1939)

Cayuga, Anderson county	$0.78

*Including Anderson, Cherokee, Limestone, Navarro counties.

PANHANDLE TEXAS

	Humble (Aug. 11, 1939) Gray County	Carson Hutchinson	Texas Co. (Oct. 2, 1939) Sweet	Sour
28-28.9	$0.72	$0.67	....	....
29-29.9	.74	.69	....	....
30-30.9	.76	.71	....	....
31-31.9	.78	.73	....	....
32-32.9	.80	.75	....	....
33-33.9	.82	.77	....	....
34-34.9	.84	.79	$0.84	$0.79
35-35.9	.86	.81	.86	.81
36-36.9	.88	.83	.88	.83
37-37.9	.90	.85	.90	.85
38-38.9	.92	.87	.92	.87
39-39.9	.94	.89	.94	.89
40 & above	.96	.91	.96	.91

Effective Aug. 31, 1939, Sinclair Prairie met Humble in Panhandle Texas. Dec. 3, 1938, Magnolia posted same schedule as Humble.

*EAST TEXAS

By Humble, Shell, Sinclair-Prairie, Stanolind, Gulf, Magnolia, Texas Co., Tide Water-Associated $1.10

*Effective dates: Aug. 11, 1939, by Humble and Tide Water-Associated; Aug. 29, 1939, by Stanolind; Oct. 2, 1939 by Sinclair Prairie; Oct. 5, 1939 by Shell; Oct. 12, 1938, by Magnolia, Texas Co.; Oct. 13, 1938, by Gulf.

*Includes Cherokee, Gregg, Rusk, Smith and Upshur counties.

Posted by Shell Oil Co., Inc. (Oct. 5, 1939)

Polk County, Tex. (Livingston area)	$1.10

NORTHEAST TEXAS

(Posted by Humble, Oct. 2, 1939)

Talco	$0.65

(Posted by Magnolia, Oct. 12, 1938)

Cass County and Panola County, Tex.:

Magnolia posts below 25° at $0.73, plus 2c differential for each degree, to top grade of 40 & above, at $1.05.

(Posted by The Texas Co., Oct. 12, 1938)

Cass County	$1.05

(a) WEST TEXAS and NEW MEXICO

	Humble	Stanolind	Shell	Texas Co. Sinclair (c)
Below 20°	$0.53	....	$0.53	....
20-20.9	.55	....	.55	....
21-21.9	.57	....	.57	....
22-22.9	.59	$0.67	.59	....
23-23.9	.61	for	.61	....
24-24.9	.63	oil	.63	....
25-25.9	.65	Below	.65	$0.65
26-26.9	.67	26°.	.67	.67
27-27.9	.69	.69	.69	.69
28-28.9	.71	.71	.71	.71
29-29.9	.73	.73	.73	.73
30-30.9	.75	.75	.75	.75
31-31.9	.77	.77	.77	.77
32-32.9	.79	.79	.79	.79
33-33.9	.81	.81	.81	.81
34-34.9	.83	.83	.83	.83
35-35.9	.85	.85	.85	.85
36-36.9	.87	.87	.87	.87
37-37.9	.89	.89	for	for
38-38.9	.91	.91	oil	oil
39-39.9	.93	.93	36° & above.	36° & above.
40 & above	.95	.95		

Posted by Magnolia Petroleum Co.

(Oct. 12, 1938 in West Texas; Oct. 15, 1939 in Lea County, N. Mex.)

	West Texas	N. Mex.		West Texas	N. Mex.
Below 25	$0.63	$0.63	33-33.9	$0.81	$0.81
25-25.9	.65	.65	34-34.9	.83	.83
26-26.9	.67	.67	35-35.9	.85	.85
27-27.9	.69	.69	36-36.9	.87	.87
28-28.9	.71	.71	37-37.9	.89	for
29-29.9	.73	.73	38-38.9	.91	oil
30-30.9	.75	.75	39-39.9	.93	36 &
31-31.9	.77	.77	40 & over	.95	above
32-32.9	.79	.79			

Note: Magnolia's West Texas postings are in Crane, Glasscock, Howard, Mitchell, Upton and Winkler counties.

Pecos County, West Texas

(Posted by Humble Aug. 11, 1939 and Shell, Aug. 29 '39)

Pecos	$0.78
Yates Shallow Pool (Shell only)	.65

Posted by Sinclair Prairie Oil Marketing Co.
(Aug. 31, 1939)

Eddy county, N. Mex.	$0.77

(a) Effective Aug. 11, 1939 by Humble; Shell Oil, Aug. 29, 1939; by The Texas Co., Oct. 12, 1938; Stanolind, Aug. 29, 1939; Sinclair Prairie, Aug. 31, 1939.

(c) Texas Co. posts $0.65 for below 26; Sinclair Prairie, $0.63 for below 25.

Note: Humble's postings are in these counties: Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler and Yoakum, West Texas; and Lea county, N. Mex.; Shell, in Crane, Ector, Glasscock, Howard, Upton, Winkler, Yoakum, Lea; Stanolind in Hendrick and Henderson field, Winkler county; Texas Co. in Ward, Winkler and Lea.

[Posted by Continental Oil Co. (Oct. 11, 1938)

Artesia, Jackson and Maljamar pools, New Mexico; gravity schedule beginning with below 29, at $0.61; 29-29.9, at $0.63; plus 2c differential for each gravity, up to 40 & above, at $0.85.

COLORADO

Posted by Continental Oil Co. (Oct. 11, 1938)
Ft. Collins and Wellington

Below 29	$0.81	35-35.9	$0.95
29-29.9	.83	36-36.9	.97
30-30.9	.85	37-37.9	.99
31-31.9	.87	38-38.9	1.01
32-32.9	.89	39-39.9	1.03
33-33.9	.91	40 & above	1.05
34-34.9	.93		
Canon City and Florence, Col.			$0.90

SOUTH AND SOUTHWEST TEXAS

All Shown Below Posted by Humble Oil & Refining Co. (Aug. 11, 1939)

Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski crudes	$0.96
Van crude	$0.93
Conroe	$1.27

(Oct. 2, 1939)

Flour Bluff and Jim Wells County	$1.23

(Sept. 14, 1939)

Hardin, Liberty county	$1.10

Oct. 12, '38, Magnolia posted $0.96 in Darst Creek; $0.87 in Luling; $0.99 in Lytton Springs; $1.14 for Cleveland, and $1.02 in Hardin, both in Liberty county, Tex.

Oct. 12, '38, The Texas Co. posted $0.96 in Darst Creek.

(Continued on next page)

CRUDE OIL PRICES

(Continued from preceding page)

***Anahuac-Dickinson** (Oct. 2, 1939)

Below 20°	$0.81	30-30.9	$1.03
20-20.9	.83	31-31.9	1.05
21-21.9	.85	32-32.9	1.07
22-22.9	.87	33-33.9	1.09
23-23.9	.89	34-34.9	1.11
24-24.9	.91	35-35.9	1.13
25-25.9	.93	36-36.9	1.15
26-26.9	.95	37-37.9	1.17
27-27.9	.97	38-38.9	1.19
28-28.9	.99	39-39.9	1.21
29-29.9	1.01	40 & above	1.23

*Anahuac-Dickinson includes Cedar Point, Fairbanks, Gillock, Hull, Pierce Junction and Raccoon Bend (shallow sand) and Turtle Bay.

Raccoon Bend (Deep sand crude) Tomball and Satsuma (Aug. 11, 1939)

22-22.9	$0.95	32-32.9	$1.15
23-23.9	.97	33-33.9	1.17
24-24.9	.99	34-34.9	1.19
25-25.9	1.01	35-35.9	1.21
26-26.9	1.03	36-36.9	1.23
27-27.9	1.05	37-37.9	1.25
28-28.9	1.07	38-38.9	1.27
29-29.9	1.09	39-39.9	1.29
30-30.9	1.11	40 & above	1.31
31-31.9	1.13		

Dec. 3, 1938, Magnolia posted above price and gravity schedule in Tomball. Effective Aug. 29, 1939, Stanolind met Humble in Tomball, except that Stanolind's schedule begins with below 29 at $1.07.

LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana

(†) (For effective dates, see footnote)

	†N. La. Ark. Sweet	Bunkie Eola, La.	†South La. Sour	†Ark. Sour	Baton Rouge-University
Below 20°	....	....	....	....	$0.79
20-20.9	$0.73	$0.83	‡$0.74	$0.63	.82
21-21.9	for	for	.77	for	.85
22-22.9	oil	oil	.80	oil	.88
23-23.9	Below	Below	.83	Below	.91
24-24.9	25°.	25°.	.86	25°.	.94
25-25.9	.75	.85	.89	.65	.97
26-26.9	.77	.87	.92	.67	1.00
27-27.9	.79	.89	.94	.69	1.02
28-28.9	.81	.91	.96	.71	1.04
29-29.9	.83	.93	.98	.73	1.06
30-30.9	.85	.95	1.00	.75	1.08
31-31.9	.87	.97	1.02	.77	1.10
32-32.9	.89	.99	1.04	.79	1.12
33-33.9	.91	1.01	1.06	.81	1.14
34-34.9	.93	1.03	1.08	.83	1.16
35-35.9	.95	1.05	1.10	.85	1.18
36-36.9	.97	1.07	1.12	.87	1.20
37-37.9	.99	1.09	1.14	.89	1.22
38-38.9	1.01	1.11	1.16	.91	1.24
39-39.9	1.03	1.13	1.18	.93	1.26
40 & above	1.05	1.15	1.20	.95	1.28

(Aug. 30, 1939)

Smackover, Ark	$0.73
Cotton Valley Distillate	$1.20

*N. La.-Ark. Sweet includes Caddo, Cotton Valley, Cross Lake, De Soto, Haynesville, Homer, Rodessa, Sabine and Sligo, La. crudes, and Miller county, Ark. S. La. Sour includes Choctaw, Darrow, N. Crowley, Roanoke and St. Martinsville. S. Ark. Sour includes Buchner, Magnolia and Village pools.

†N. La.-Ark. Sweet crude and S. La. Sour effective Aug. 30, 1939, except Cross Lake, La., Sept. 7, Baton Rouge-Univ., Sept. 11, and Bunkie and Eola, Oct. 23, 1939; and Ark. Sour, Sept. 13, 1939.

‡For Below 21°.

Effective Sept. 8, 1939, Gulf Refg. Co. met S. O. La's. N. La.-Ark. Sweet prices in Bull Bayou, Caddo, Crichton, De Soto, Haynesville, Homer, and El Dorado

Posted by Arkansas Fuel Oil Corp.

Urania, La. (Jan. 28, 1937)	$1.02

Posted by Continental Oil Co.

(Oct. 11, 1938)

Tepetate and Ville Platte, La.	$1.03

(Jan. 1, 1939)

Abbeville, La.

Below 36	$0.92	38-38.9	$0.98
36-36.9	.94	39-39.9	1.00
37-37.9	.96	40 & above	1.02

Posted by Caddo Crude Oil Purchasing Corp.

(Aug. 14, 1939)

Allison area, Shreveport field	$0.95

Lisbon, N. La. (Sept. 14, 1939)

27-27.9	$0.66	32-32.9	$0.76
28-28.9	.68	33-33.9	.78
29-29.9	.70	34-34.9	.80
30-30.9	.72	35 & above	.82
31-31.9	.74		

Lisbon prices met by Gulf, Sept. 14.

Note: S. O. Louisiana prices in all La.-Ark. fields, effective Oct. 5, 1938, are on 100% tank table basis.

GULF COASTAL FIELDS

(a) (For effective dates, see footnote)

	Continental Humble Sinclair Stanolind	Refugio Crude (Humble, Continental)	Texas Co.	Shell
Below 20	$0.86	$0.91	$0.86	(b)$0.79
20-20.9	.88	.93	.88	.81
21-21.9	.90	.95	.90	.83
22-22.9	.92	.97	.92	.86
23-23.9	.94	.99	.94	.89
24-24.9	.96	1.01	.96	.92
25-25.9	.98	1.03	.98	.95
26-26.9	1.00	1.05	1.00	.98
27-27.9	1.02	1.07	1.02	1.00
28-28.9	1.04	1.09	1.04	1.02
29-29.9	1.06	1.11	1.06	1.04
30-30.9	1.08	1.13	1.08	1.06
31-31.9	1.10	1.15	1.10	1.08
32-32.9	1.12	1.17	1.12	1.10
33-33.9	1.14	1.19	1.14	1.12
34-34.9	1.16	1.21	1.16	1.14

(Continued in next column)

35-35.9	1.18	1.23	for oil	for oil
36-36.9	1.20	1.25	for oil	for oil
37-37.9	1.22	1.27	34° & above.	34° & above.
38-38.9	1.24	1.29		
39-39.9	1.26	1.31		
40 & above	1.28	1.33		

(a) Effective Oct. 2, 1939 by Continental, Humble and Texas Co.; Oct. 3, 1939 by Sinclair and Stanolind; Aug. 29, 1939 by Shell. Stanolind's lowest grade is below 21, at $0.88. Refugio, effective Oct. 2, '39 by Humble.

(b) Shell posts these prices in Iowa district, Black Bayou and White Castle, La.; prices in Iowa district have 2 lower grades: below 18, at $0.75, 18-18.9, $0.77; and 19-19.9, is $0.79.

Note: Humble's Gulf Coast prices apply in these Texas fields: Amelia, Clear Lake, Goose Creek, Mirando which includes Duval, Jim Hogg, Webb and Zapata counties and Heyser and Placedo fields; Mykawa, Sugarland, Thompsons and Webster.

Humble's prices in Refugio include crudes purchased in Saxet, East White Point, Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor fields.

Stanolind's prices apply in High Island and Spindletop; also in Clinton, Hastings and South Houston, where, effective Jan. 1, 1940, lowest grade is below 21° at $0.88; rest of schedule same as other Gulf Coast. Magnolia posts Mirando, effective Oct. 2, same prices as Humble. Texas Co.'s prices are in Texas and La., Gulf Coast; its prices on Refugio are same as Humble's up to 28 gravity; 28 & above, $1.09; on Duval-Mirando same as Humble's up to 28; 28 & above, $1.04; it posts Golden Meadow, La., 24-30 grav., $0.90, plus 2c differential, to 40 & above, $1.10.

Posted by Shell Oil Co., Inc. (Aug. 29, 1939)

Gibson field, Terreborne Parish, La.	$1.04

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.

(Effective Oct. 1 1, 1938)

Salt Creek, (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma-Kansas, ranging from $0.86 to $1.10, which see under Mid-Continent crude on previous page.

Tensleep, Salt Creek field	$0.646
Ites, heavy	0.92
Elk Basin, light	0.90
Grass Creek, light	0.90
Frannie light	0.55
Grass Creek, heavy	0.40
Hamilton Dome, Wyo	0.35
Frannie heavy	0.42

Posted by Ohio Oil Co. (Oct. 11, 1938)

Elk Basin, Wyo.	$0.90	Rock Creek	1.00
Grass Creek, light	0.90	Lance Creek	0.77
Dry Creek, Mont.			0.92
Grass Creek, heavy (May 1, 1938)			$0.50
Sunburst, Mont. (Nov. 16, 1937)			$0.90

Posted by Continental Oil Co.

(Oct. 11, 1938)

Cat Creek, Mont.	$1.10
Big Muddy, Wyo.	0.98
Lance Creek, Wyo.	0.77

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 1, 1940

Gravity	Signal Hill (Long Beach) and others*	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda Brea Canon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley Canal	Coles Levee Richfield Western	Mountain View and others**	Elk Hills	Buena Vista Hills, Midway-Sunset, Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria Val. (Union Oil, Sept. 1 '39)
14-14.9	$0.65	$0.64	$0.63	$0.64	$0.65	$0.61	....	$0.65	$0.61	$0.61	$0.62	$0.63	....	....	....	$0.60	$0.60	$0.60	$0.60	$0.60	....	$0.42
15-15.9	.65	.64	.63	.64	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	.60	....	.44
16-16.9	.65	.64	.63	.64	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	.60	....	.45
17-17.9	.65	.64	.63	.68	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	.60	....	.46
18-18.9	.65	.64	.63	.71	.65	.65	....	.68	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	.60	....	....
19-19.9	.69	.64	.67	.75	.70	.69	....	.72	.61	.65	.62	.63	....	....	....	.60	.64	.64	.64	.61	$0.60	....
20-20.9	.73	.64	.72	.79	.76	.74	....	.75	.65	.69	.62	.67	....	....	....	.60	.69	.69	.69	.62	.60	....
21-21.9	.78	.64	.76	.82	.81	.78	....	.79	.69	.73	.62	.72	$0.63	....	....	.64	.74	.74	.74	.66	.60	....
22-22.9	.82	.69	.81	.86	.86	.82	....	.82	.73	.77	.66	.76	.63	....	....	.68	.79	.79	.78	.70	.63	....
23-23.9	.86	.75	.85	.89	.92	.86	$0.71	.86	.78	.82	.71	.81	.67	....	....	.71	.84	.84	.82	.74	.67	....
24-24.9	.90	.80	.90	.93	.97	.90	.77	.89	.82	.86	.75	.85	.72	....	....	.75	.89	.89	.86	.78	.71	....
25-25.9	.95	.86	.94	.96	1.02	.95	.82	.93	.86	.90	.80	.89	.77	....	....	.79	.94	.94	.90	.82	.75	....
26-26.9	.99	.91	.99	1.00	1.08	.99	.88	.96	.90	.94	.84	.94	.82	....	....	.83	.99	.99	.95	....	....	....
27-27.9	1.03	.97	1.03	1.04	....	1.03	.94	1.00	.94	.98	.89	.98	.87	$0.83	$0.92	.87	1.04	1.04	.99	....	....	....
28-28.9	1.07	1.02	1.07	1.07	....	1.07	.99	1.03	.98	....	.93	1.02	.91	.86	.96	.91	1.09	1.09	1.03	....	....	....
29-29.9	1.10	1.07	1.11	1.10	....	1.10	1.04	1.06	1.02	....	.98	1.06	.96	.90	.99	.95	1.14	1.14	1.07	....	....	....
30-30.9	1.14	1.12	1.15	1.14	....	1.14	1.09	1.09	....	....	1.02	1.10	1.01	.94	1.02	.99	1.19	1.19	1.11	....	....	....
31-31.9	....	....	....	1.17		1.17	1.14	Elwood Terrace			1.07	1.14	1.05	.98	1.06	1.02	1.24	1.24				
32-32.9	....	....	....	1.20		1.20	1.19	F. o. b. ship.			1.11	1.18	1.09	1.02	1.09	1.06	1.29	1.29	Kettleman Hills			
33-33.9	....	....	....	....		....	1.24	....	$1.21	....	1.15	1.22	1.14	1.06	1.13	1.10	1.34	1.34	....	$1.12	....	....
34-34.9	....	....	....	....		....	1.29	....	1.25	....	1.20	1.26	1.19	1.10	1.16	1.14	....	....	....	1.17	....	....
35-35.9	....	....	....	....		....	1.34	....	1.29	....	1.24	....	1.23	1.14	1.20	....	....	....	....	1.21	....	....
36-36.9	....	....	....	....		....	1.39	....	1.33	....	1.28	....	1.27	1.18	1.23	....	....	....	....	1.25	....	....
37-37.9	....	....	....	....		....	1.44	....	1.37	....	1.33	....	1.31	1.22	1.26	....	....	....	....	1.29	....	....
38-38.9	....	....	....	....		....	1.49	....	....	....	1.37	....	1.36	1.25	1.30	....	....	....	....	1.33	....	....
39-39.9	....	....	....	....		....	1.54	....	....	....	1.42	....	....	1.29	1.34	....	....	....	....	1.38	....	....
40-40.9	....	....	....	....		....	1.59	....	....	....	1.46	....	....	1.33	1.37	....	....	....	....	....	....	....
41-41.9	....	....	....	....		....	....	....	....	....	1.50	....	....	1.37	1.40	....	....	....	....	....	....	....
42-42.9	....	....	....	....		....	....	....	....	....	1.54	....	....	1.41	1.44	....	....	....	....	....	....	....
43-43.9	....	....	....	....		....	....	....	....	....	1.59	....	....	1.45	1.47	....	....	....	....	....	....	....
44-44.9	....	....	....	....		....	....	....	....	....	1.63	....	....	1.49	1.51	....	....	....	....	....	....	....
45-45.9	....	....	....	....		....	....	....	....	....	1.67	....	....	1.53	1.54	....	....	....	....	....	....	....
46-46.9	....	....	....	....		....	....	....	....	....	1.71	....	....	1.57	1.57	....	....	....	....	....	....	....
47-47.9	....	....	....	....		....	....	....	....	....	....	....	....	1.61	....	....	....	....	....	....	....	....
48-48.9	....	....	....	....		....	....	....	....	....	....	....	....	1.64	....	....	....	....	....	....	....	....

FOB Standard Pipeline

*El Segundo prices same as Signal Hill. Wilmington prices same as Signal Hill, except below 19 gravity prices are: 14-16.9, $0.60; 17-17.9, $0.62; 18-18.9, $0.64.

**Includes Newhall, McKittrick, Kern River, Round Mountain and Kern Front, schedule for which ends with 19-19.9. Mountain View schedule begins with 19-19.9.

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Farrell Mfg. Co. .....
Fleet-Wing Corp. .....
Ford Motor Co. .....
Freedom Oil Co. .....
Fruehauf Trailer Co. .....

General American Transportation Corp. .....
General Electric Co. .....
General Motors Truck & Coach Division .....
Giant Tire & Rubber Co. .....
Gilbert & Barker Mfg. Co..Fourth Cover
Goodrich Co., B. F. .....
Goodyear Tire & Rubber Co. .....
Graver Tank & Mfg. Co. .....
Great Lakes Steel Corp. .....
Gulf Oil Corp. .....

Heil Co., The .....
Humble Oil & Refining Co. .....

Industrial Oil Corp. .....
International Harvester Co. .....
International Metal Hose .....

Johnson-Williams, Ltd. .....

Kellogg Div. of American Brake Shoe & Foundry Co. .....
Kidde, Walter & Co., Inc. .....

Leland Electric Co. .....

Mack Trucks, Inc. .....
McDonald Mfg. Co., A. Y. 1
Master Electric Co. .....
Morrison Bros. .....
Morton Salt .....

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National Refining Co. .....
Neptune Meter Co. .....
New York Lubricating Co. .....

Ohio Oil Co. .....
Onliwon Toilet Seat Covers, (A.P.W. Paper Co., Inc.) .....
Overhead Door Corp. 38

Paraflow .....
Pennsylvania Grade Crude .....
Pennsylvania Petroleum Products..
Philadelphia Valve Co. .....
Phillips Petroleum Co. .....
Pittsburgh Equitable Meter Co. ....
Pump & Meter Mfg. Co., The .....
Pure Oil Co. .....

Quaker State Oil Refining Co. 4

Republic Oil Co. .....
Roper Corp., Geo. D. .....

Sani-Flush (The Hygienic Products Co.) .....
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Standard Steel Works .....
Stewart-Warner Corp. .....
Sun Oil Co. .....

Texaco Development Corp. .....
Tidewater Associated Oil Co. .....
Tokheim Oil Tank Co. ...Second Cover

Universal Oil Products Co. 29

Viking Pump Co. 36

Wayne Pump Co. .....
Westinghouse Electric & Mfg. Co. ..
Wheeling Corugating Co. .....
White Motor Co. .....
Witte Engine Works .....

· PERSONALS ·

"Ahunting we will go", is the theme song for **E. G. Guy,** vice-president, and **"Jack" Fleckenstein,** salesmanager, of Crystal Refining Co., Carson City, Mich. Mr. Guy is looking forward to the pheasant season, while Mr. Fleckenstein is waiting for the deer season to open. Mr. Guy, meanwhile, is toughening up his shoulder and sharpening his shootin' eye by trap shooting back of the refinery.

* * *

Klarence (Ike) Krone, Los Angeles, formerly with Sunset Oil Co. and Tide Water Associated Oil Co., is now handling lubricating oil sales for the Petrol Corp.

* * *

J. R. Pemberton, Los Angeles, formerly California oil umpire, has opened offices here as a petroleum geologist and engineer, specializing in taxation, at 714 West Olympic Blvd.

* * *

Robert H. Beattie, New Orleans, president of General Oil Co., is one oil man who isn't afraid of Friday, September the 13th. He married Mrs. Russel Stone, also of New Orleans, on that date, and is expected back from honeymooning by time this goes to press.

* * *

"A-ten—tion! Shoulder Arms!, Forward March!, and other military phrases is nothing new to **Capt. James W. Perkins,** 117th Infantry (Rifles) Tennessee National Guards, who is now doing a year's service at Camp Jackson, S. C. Captain Perkins is president of Red Ace Petroleum Co., Inc., Nashville and a director of the Tennessee Oil Men's Assn.

* * *

Attending the 25th anniversary celebration of the discovery of oil in the El Dorado, Kans. field Sept. 26, were many of the "old timers" who had a hand in some way or other in the discovery.

There was **D. B. Golden** of El Dorado, drilling contractor; **Baldy Harper** of El Dorado, driller; **James L. Henderson** and **James Davis** of Wichita, early day operators; **Clark R. Edgecomb** of Long Beach, Calif., builder of El Dorado's first refinery and incorporator of the old Trapshooter Oil Co.; and **W. M. McKnab** of Winfield, pioneer operator.

Mrs. Atherton of El Dorado, who drove the stake for the discovery well, was also on hand with her husband, **G. R. Atherton,** honored as "Grand Old Man of the El Dorado Field." **James M. Brennan** of El Dorado, driller of the old Stapleton No. 1 well, was designated "Grand Old Man of the Reunion."

* * *

Neither rain, hail, snow, heat, nor a blizzard, and now an injured leg and a torn rib, have kept **C. B. McCullough** away from his desk. Mr. McCullough is assistant division manager of White Star-Ohio Division of Socony-Vacuum Oil Co.

About a month ago, this "work-whatever-happens-to-me" oil man was getting out of a boat in Canada when it rolled on his leg, necessitating a cast up to his hip. Returning to work, Mr. McCullough became so interested in some office matter that he forgot to use his cane and fell down stairs, tearing a rib loose. You've guessed it—he's back at work, and as we go to press, both feet are under him.

* * *

Peter J. Ruman, New Orleans, vice-president of General Oil Co., is back at his desk in as fine condition as ever, after an automobile accident Sept. 24 on a highway near New Orleans. His car went into a skid on wet pavement and turned over, wrenching Mr. Ruman's back and severely bruising his leg.

* * *

Upon two Houston oil men rests the responsibility of raising at least one half of this Texas city's Community Fund. **Frank A. Watts,** purchasing agent for Humble Oil & Refining Co. and **O. D. Story,** purchasing agent for Shell Oil Co., Inc., have been appointed co-chairmen of the big gifts division of the "Fund". It will be their job to collect a pre-campaign drive of Houston's most generous givers.

* * *

George R. Monkhouse, Cleveland, was recently transferred here from Hartford, Conn., and made sales manager of the Cleveland division of Shell Oil Co. Previously, he headed the Hartford division. Mr. Monkhouse replaces **F. W. Harper** who was transferred to Indianapolis and made lube oil sales manager.

* * *

Three Sun Oil Co. promotions went into effect recently, states S. B. Eckert, vice-president: In each of the following cases, these men were promoted from acting district manager to full district manager: **R. J. Reilly,** Rochester, N. Y. district; **C. B. Moore,** Altoona, Pa., district; and **E. C. Willcott,** Lawrence, Mass. district.

* * *

Speaking about higher education in the current house organ of the Humble Oil & Refining Co., Houston, **S. A. Giraud,** member of the board of directors and chairman of the Manufacturing Committee, says: ". . . it is gratifying to know that so many employes are taking advantage of special training whether it be vocational or otherwise. They are not only fulfilling their desire for additional knowledge, but are also equipping themselves with the fundamentals for more efficient service, both as employes and citizens."

* * *

R. S. Orr, Indianapolis division manager for Standard of Indiana succeeded **G. W. Coldsnow,** who resigned as division head at La Crosse, Wis., **President Edward G. Seubert** announced Oct. 1.

R. F. Baity, manager at Davenport, Ia., steps into the same position at Indianapolis; **J. W. Honomichl,** manager at Duluth, Minn., follows Mr. Baity at Davenport; and **C. M. Monson,** manager at Joliet, Ill., succeeds Mr. Honomichl at Duluth.

C. E. Quinn, assistant manager at Detroit has been made Joliet manager, and **J. M. Hamer,** sales promoter in the Chicago office has been made assistant manager at Detroit.

F. H. Fillingham, assistant general manager in charge of the northern division and **H. J. Bemis,** assistant general manager in charge of the eastern division, both at Chicago, will exchange positions, as will **D. J. Byers,** assistant manager (wholesale) and **C. C. Smith,** assistant manager (reseller), both at St. Louis.

* * *

J. V. McCormick, some years ago sales manager for the Independent Oil & Gas Co., of Tulsa, which was later acquired by Phillips Petroleum Co., for the past two years has been living in Johnsonburg, Pa., looking after interests entirely outside the oil industry. He says the urge is growing to again become active in oil marketing.